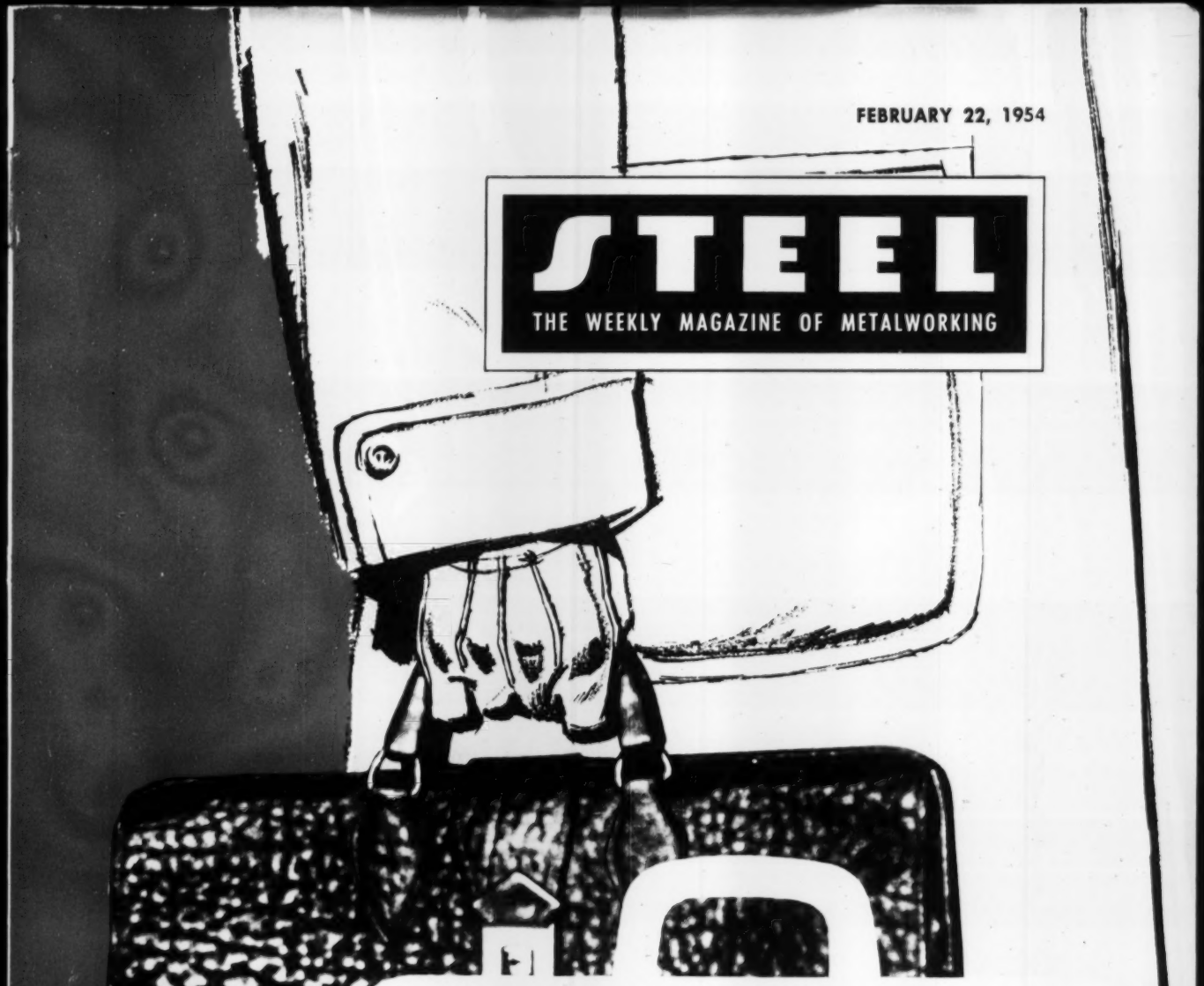
FEBRUARY 22, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



No. 1 in 1954 Management Series

...Now You Have To Sell

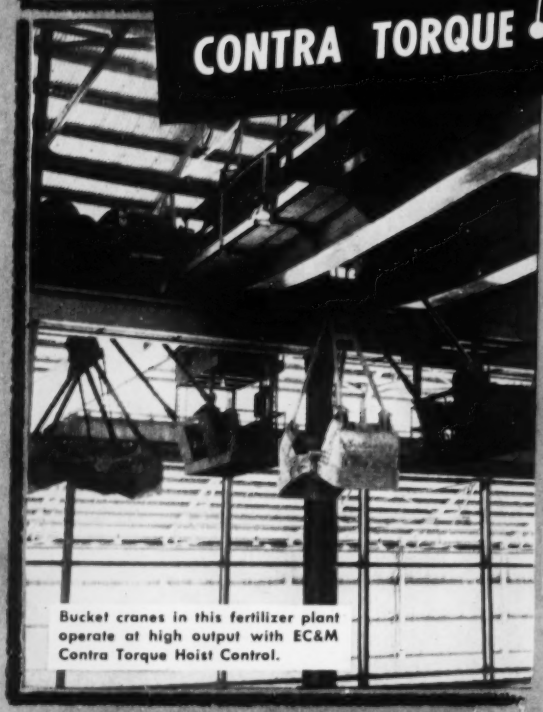
Better selling is the best answer to rising competition. For pointers on how to realize sales potentials, see p. 91

CONTENTS — PAGE 5

How EC&M Frequency Relay Control improves A-C Bucket Cranes

Bucket crane of the Level-Luffing type operates speedily under EC&M Contra Torque Hoist Control.

CONTRA TORQUE



Bucket cranes in this fertilizer plant operate at high output with EC&M Contra Torque Hoist Control.

FAST GETAWAY—Quickly responsive to the frequency of the induced-rotor voltage, EC&M Frequency Relays match torque requirements to the load . . . get the motor up to speed quickly for lowering the bucket —to move the trolley in or out . . . cut down the time between trips.

WIDE SPEED SELECTION—These Relays permit starting-down on any master switch point—no waiting until last point is reached. And a better speed choice gives greater flexibility in clean-up operations, and speeds up output.

SMOOTH STOPPING—When checking motor lowering speed, weak torques are provided for light loads or the empty bucket; stronger torques for heavier loads. Trolley motor is stopped and reversed smoothly under Frequency Relay automatic operation.

SPEED-LIMITING *Safety* on all Speeds. These relays (one set for hoisting and lowering) automatically shift motor connections to safeguard lowering operation with greater skill than human hands could do it.

It Pays To Specify E&M *Control*

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Effects of Elements Used in Alloy Steels

This is the second of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

To simplify a rather complex subject, let's outline some of the individual effects of four leading alloying elements used in alloy steels:

NICKEL—One of the fundamental alloying elements, nickel provides such properties as deep hardening, improved toughness at low temperatures, low distortion in quenching certain types of tool steels, good resistance to corrosion when used in conjunction with chromium in stainless grades, and ready response to economical methods of heat-treating.

CHROMIUM—This element is used extensively to increase the corrosion-resistance of steel. It also improves the surface resistance to abrasion and wear. It exerts a toughening effect and increases the hardenability.

MOLYBDENUM—This element exerts a strong effect on the hardenability and toughness of steel. It greatly increases strength at high temperatures as well as the creep-strength of steel.

VANADIUM—An element used to refine the grain and enhance the mechanical properties of steel.

A combination of two or more of the above alloying elements usually imparts some of the characteristic properties of each. For example, chromium-nickel grades of steel develop good hardening properties with excellent ductility. And chromium-molybdenum steels develop excellent hardenability with satisfactory ductility and a certain amount of heat-resistance. In other words, the total effect of a combination of alloying elements is usually greater than the sum of their individual effects. This interrelation must be taken into account whenever a change in a specified analysis is evaluated.

Bethlehem metallurgists can be of considerable help to you in selecting the proper alloy steel for any use. These men will gladly give unbiased advice on alloy steel analysis, heat-treatment, machinability, and expected results. Feel free to call upon them at any time.

And please remember, too, that Bethlehem manufactures all AISI standard alloy steels, as well as special-analysis steels and the full range of carbon grades. You can rely upon their quality, always.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

now even better

SKF Triple-Seal "SAF" PILLOW BLOCKS

BETTER Because SKF's Type "C" Spherical Roller Bearings . . .

increase capacity 25% to 50%

increase service life 2 to 3½ times

Designers throughout industry have heard the news from SKF—news about the SKF Type "C" Spherical Roller Bearing which, size for size, gives up to 50% increased capacity, 2 to 3½ times longer life!

Now there's more SKF news:

You can now get the famous SKF Triple-Seal "SAF" Pillow Block *equipped with the Type "C" Spherical Roller Bearing!*

This *in addition* to effective sealing from dirt.

This *in addition* to lubricant retention.

This *in addition* to adapter mounting for tight fits on standard shafting; "Free" or "Held" design.

This *in addition* to easy installation and inspection.

This *in addition* to bearings that self-align.

This *in addition* to greatly *increased bearing capacity and life.*

No other available bearing design gives you the capacity and life of the SKF Type "C" Spherical. Plan on it as part of your design, wherever you need a heavy-duty Pillow Block.

Any SKF District Office will help you. **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA. — *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.* 7522

Send for SKF Bulletin No. 365-A—which gives complete facts—sizes available—increased life you can expect for each size.

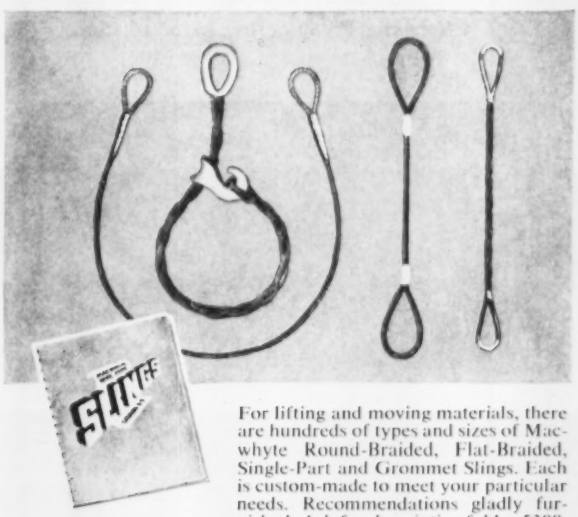
SKF®
BEARINGS AND PILLOW BLOCKS

Get long, low-cost service with

MACWHYTE

WIRE ROPE • SLINGS • ASSEMBLIES

In Macwhyte's complete line there are a thousand and one sizes and types of wire rope. Thoroughly lubricated and PREformed—they are engineered to give long, low-cost service on your equipment. Recommendations gladly furnished—ask for Catalog G-15.



For lifting and moving materials, there are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part and Grommet Slings. Each is custom-made to meet your particular needs. Recommendations gladly furnished. Ask for descriptive folder 5308.

Macwhyte Safe-Lock Wire Rope Assemblies are made to order in length, strength and flexibility desired. Terminals are permanently attached to one or both ends. Recommendations gladly furnished. Ask for Catalog 5201.

MACWHYTE WIRE ROPE

MACWHYTE COMPANY

2912 **Fourteenth Avenue**
Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope—Round-Braided and Flat-Braided Wire Rope Slings—Stainless Steel Wire Rope—Monel Metal Wire Rope—Aircraft Cable and Swaged Fittings—Safe-Lock Wire Rope Assemblies.

Mill Depots: New York, Pittsburgh, Chicago, St. Paul, Fort Worth, Portland, Seattle, Los Angeles. Distributors throughout U.S.A.

11 TIMES THE SERVICE

Steel mill was using rag roll as pinch roll on a shear unit. It lasted about three months on the job. Oil, heat, cutting and pressure contributing toward short life.

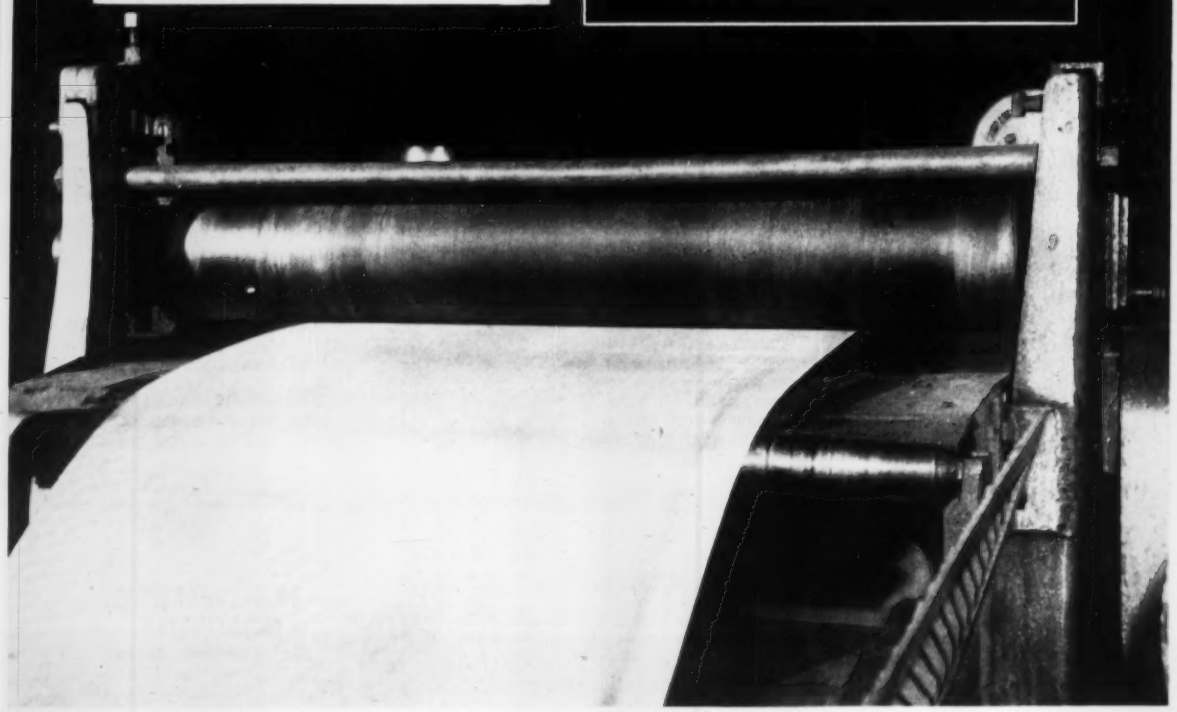
The G.T.M.—Goodyear Technical Man—recommended using a rubber-covered roll, specified compound and thickness to be used in covering the roll. This roll has served 33 months to date—*11 times the service at a slightly lower original cost.*

Why not discuss your roll covering problems—or procurement of complete rolls—with the G.T.M., or write Goodyear, Industrial Products Div., Akron 16, Ohio.

GOODYEAR INDUSTRIAL PRODUCTS

GTM-Specified TYPICAL ROLL APPLICATIONS FOR STEEL MILLS

PROCESSES	TYPES OF ROLLS	
Electrolytic Tin Line	Scrubber	Slitter
Carbon Steel Pickling	Wringer	Tension
Continuous Galvanizing Line	Pinch	Directional
Continuous Annealing Line	Hold-down	Carrying
		Coating



YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing, Tank Lining, Rubber-Covered Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

We think you'll like
THE GOODYEAR TELEVISION PLAYHOUSE
every other Sunday — NBC TV Network

GOODYEAR

THE GREATEST NAME IN RUBBER

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING
Vol. 134 No. 8 February 22, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

Metalworking Outlook 43
New aspects of business, profits, labor and other subjects are analyzed for your guidance by the editors

As the Editor Views the News 47

Windows of Washington 58
Reflections from the nation's capital report impact of government upon industry

Mirrors of Motordom 65

The Business Trend 69

Men of Industry 73

Technical Outlook 101

Controlled Hot Dip Galvanizing 102
First of a series of three articles on the subject. An expert sums up what research has shown

Sigma Welding of Carbon Steel 104
A progress report of research, development and commercial exploitation of process as applied to carbon steel

A Pinch of Boron Doubles Yield Point of Low-Carbon Steel 107
Molybdenum and boron in small quantities double yield without necessity of heat treatment

Progress in Steelmaking 113
Integrated Electrical System Is the Heart of the Modern Blast Furnace—Typical installation described

New Products and Equipment 123

Maintenance: Selling, Organization Come First 134
Biggest stumbling block is selling an effective program to management

The Market Outlook 139
Metal Prices and Composites begin on Page 140

Nonferrous Metals 142

Behind the Scenes	6	Foreign News	61
Letters to the Editors	10	Obituaries	79
Calendar of Meetings	27	Helpful Literature	127

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...if only for THEIR sakes

...learn how to protect yourself from death from cancer. They need *you!*

And for your sake and theirs you must keep on remembering that the best cancer "insurance" is:

FIRST... *to make a habit of periodic health check-ups no matter how well you may feel, always including a thorough examination of the skin, mouth, lungs and rectum and (for women) the breasts and generative tract.*

SECOND... *to learn the seven danger signals that may mean cancer, and go straight to the doctor at the first sign of any one of them—(1) Any sore that does not heal (2) A lump or thickening, in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.*

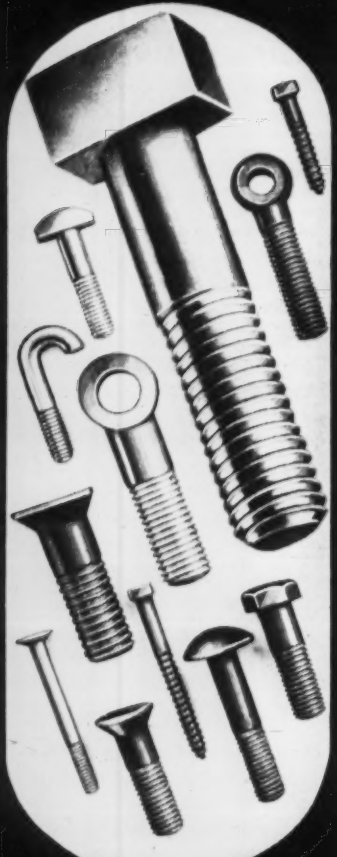
For other life saving facts about cancer, phone the American Cancer Society office nearest you, or address your letter to "Cancer"—in care of your local Post Office.

American Cancer Society

THREADED SPECIALTIES

TEE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost tee-head bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket tee-head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

BETTER BOLTS SINCE 1882

PAWTUCKET

THE BOLT MAN

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T M REG.

behind the scenes

Dear Shrdlu

They say the steel industry didn't use much imagination in handing out job titles. Be that as it may, job titles in the industry are essentially short job descriptions, and since there are close to 7000 different kinds of tasks in steelmaking, it is not surprising to find some unusual sounding chores.

A Mud Mixer is just exactly that—he mixes mud for the furnaces. What a Scrap Stocker does is rather obvious, as is a Pump Tender, a Car Dumper and a Flue Dust Mixer. A Skull Cracker Craneman runs a crane which carries a heavy ball which breaks the steel residue (skull) from empty ladles.

A Pig Machine Helper simply helps the man who runs the machine which molds pig iron, and so on *ad infinitum* until every man in a steel mill has a descriptive title—a fairly accurate one if unglamorous.

A Cinder Snapper's job is not so obvious, nor is a Topman, a Dustman, a Skidman. A Bottom Maker, a Bottom House Craneman and a Ladle Patcher all work around bessemer converters.

But this is no fun. How about trying to figure out what all these titles mean? See if you can make sense out of these titles and figure out why the jobs were so named.

Take a look at a Stopper Maker, a Stripper, Nozzle Setter, Ladle Liner, Hot Top Liner, a Slagger, a Bottom Pour Liner or a Checker Cleaner. Perhaps you would like to qualify as an Ingot Buggy Operator, or a Soaking Pit Heater, a Gun Operator, a Coke Breeze Unloader or a Roll Hand. Maybe you could take a whack at being a Hot Saw Operator, a Stop Setter, a Slow Cool Tender or a Rail End Grinder.

Quite a few men make a living as a Chipper, a Wrencher, Scarfer, Manipulator, Hooker, Sorter, Looper, Charger, Rougher, Discharger, Stitcher, Hostler, Blocker, Ragger, Pusher, Bundler, Drifter, Racker or Rigger.

What would you call a man who operates a hardener? A Flying Shearman is not the name of a wrestling hold, nor is a Swing Grinder necessarily a good dancer. The man in the bloom pulpit is an engineer and rarely ever a man of the cloth, and a Shot Blaster doesn't even need a permit to carry a gun. A Screwdown Operator and a Layerout are buddies and have very little in common with a Hot Bed Craneman or a Bar Catcher. A First Strip Finisher might never become acquainted with the Second Blowing Engineer. An Axle Forger does not sign other people's names any more than the man who runs the screwbox.

Somebody got the idea that a Die Blower furnished the music for the act of a Hot Stamper and Strip Slitter, but nothing could be farther from the truth. Nor does a Pinman assume the role of a procurer, nor is a Push Out a bouncer. The guy who knows the theory of the cold pass probably could not qualify as a Tool Temperer. One would guess that the Solution Tender was responsible for the Pickling Craneman, but the Heat Chaser and the Salt Thrower would have something to say no doubt. The Bed Operator and the Bundling Recorder must have something in common.

Many Kick-off Men have never touched a football, and there are plenty of Keg Headers who don't drink a drop. You'd think the fellow who had charge of the Gag Press would write funny stories for TV comedians during his time off, but actually he often loafs with the Gang Leader instead. Both of them frequently call on the Hot Stripper during off hours—making sure of course that the Hot Bed Shearman is not around. If they make too much of a ruckus, the Flask Closer and the Blowout Man join up to close the place.

The average Shakerman probably never mixed a drink, and it's doubtful if the normal Sheet Cleaner ever helps his wife with the family washing. A lot of people think a Hot Roll Foreman runs a bakery, but that's only propaganda. Evidence to the contrary notwithstanding, a Tong Catcher is not a policeman in Chinatown, nor is a Potman a stakeholder in a gambling joint.

Any questions?

L. Sellars,
Hill & Knowlton,
Pittsburgh, Pa.

Shrdlu

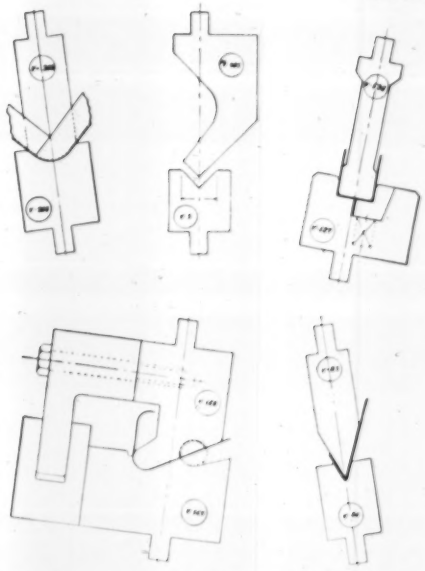
(Editorial Outlook—Page 43)

THIS 112 PAGE BOOK ANSWERS HUNDREDS OF METAL FORMING PROBLEMS

The new Verson DIE MANUAL

DM-53

AVAILABLE NOW



A Verson Press for every job from 60 tons up.

JUST off the press, the new enlarged Silver Anniversary edition of the Verson Die Manual contains 112 pages devoted to a pictorial presentation of Verson press brake dies and special tooling along with detailed text and tables on how to select dies for specific jobs, tonnages required, etc. Representing the culmination of twenty-five years of Verson Die Manuals, this edition has been developed and organized to be as convenient and helpful to the user as we know how to make it, even to the point of incorporating a plastic binding that permits the book to lay flat wherever it is opened. While the Manual does not show every possible press brake die, it is remarkably complete and covers all commonly used types. To get your copy simply write on your company letterhead.

Verson

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • SO. LAMAR AT LEDBETTER DRIVE, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

REACHING A NEW
In Refractory Castables

Better research and ceramic engineering at Walsh—responsible for many important contributions to longer refractory life—has resulted in the development of an outstanding line of refractory castables. Available in a complete range—from Light Weight Insulating up to the Service types that withstand operating temperatures of 3000 degrees F.—all may be cast, trowelled or air gun applied.

Walsh Castables are characterized by high green and burnt strength throughout their respective temperature ranges. This feature is particularly marked in the light weight castables without in any way sacrificing resistance to heat flow.

For a new high in efficiency and economy, specify Walsh Refractory Castables. There is a type to meet your particular need. Write today for details.

Light Weight Castables

LITE-WATE CASTABLE NO. 50—Recommended maximum operating temperature—2100 deg. F. Burned in weight—50 lbs. per cu. ft.

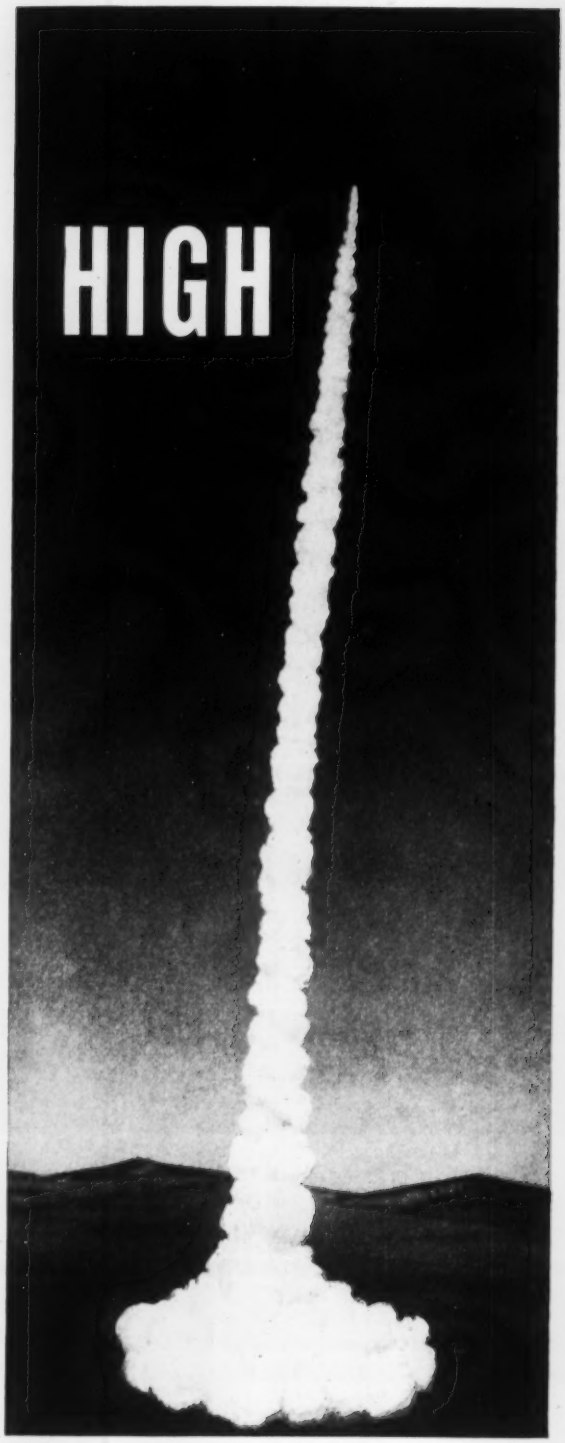
LITE-WATE CASTABLE NO. 70—Recommended maximum operating temperature—2300 deg. F. Burned in weight—70 lbs. per cu. ft.

Service Castables

H & B CASTABLE*—Recommended maximum operating temperature—2700 deg. F. Weight per cu. ft., dry, in place—130 lbs.

SUPER CASTABLE NO. 32—Recommended maximum operating temperature—3000 deg. F. Weight per cu. ft., dry, in place—125-130 lbs.

***WALSH H & B CASTABLE** is available in various grain sizes for desired increases in green and fired strength.



WALSH REFRACTORIES CORPORATION
America's Best Clays

WALSH REFRACTORIES CORPORATION

101 FERRY STREET • ST. LOUIS 7, MISSOURI

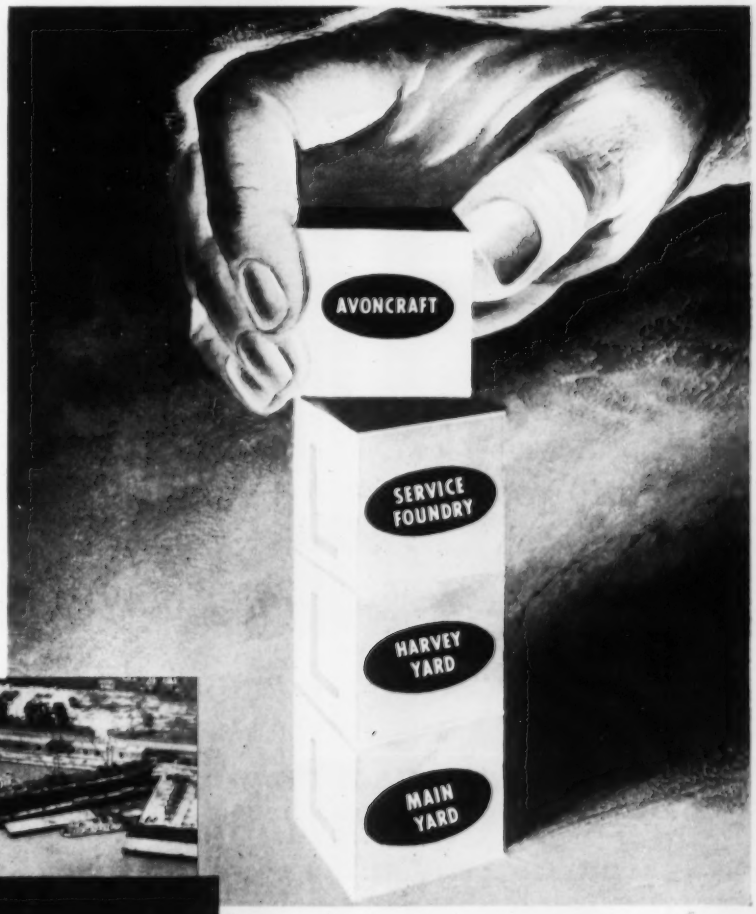
FOR OVER 50 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

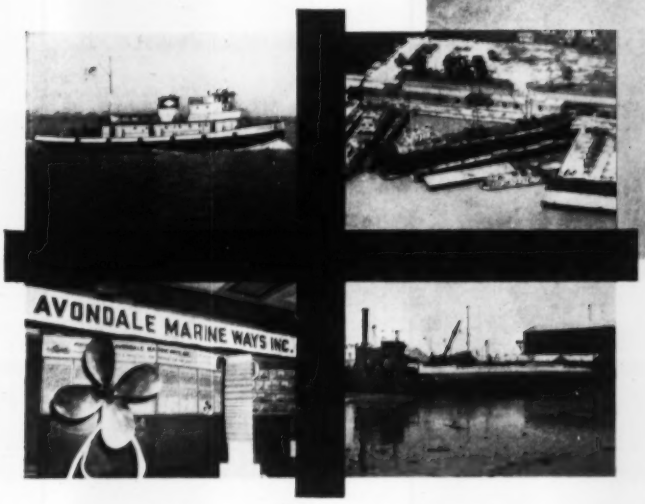
AVONDALE ADDS A 4th DIVISION

Now using more STEEL than ever before..

AVONCRAFT . . .
"Avondale's Salute to Steel"

Now . . . more than ever before, with the new Avoncraft Division joining Avondale's trio of industries —STEEL is Avondale's tool! This new division manufactures load-bearing walls, load-span decking and curtain walls for countless exterior and interior building uses. And more than ever, steel is the Avondale medium . . . for Avoncraft's products are made of steel, in one of its most recent and widely-accepted forms— architectural porcelain enamel. The new Avoncraft Division, which is located at Avondale, La., promises to be a truly great addition to the already-famous Avondale industrial trio, and to the name and fame of STEEL!





***MAIN YARD** • Avondale, La. Ship and barge building and repairs, tank cleaning and steel fabrication.*

***HARVEY YARD** • Harvey, La. Quick repairs, dry-docking, and propeller service.*

***SERVICE FOUNDRY** • New Orleans, La. Iron, steel and non-ferrous castings, cut gears, and large capacity machine work.*

***AVONCRAFT DIVISION** • Architectural porcelain enamel on steel load-bearing walls, load-span decking and curtain walls.*

SHIP BUILDING • SHIP REPAIRING • FOUNDERS • PROPELLERS • STRUCTURAL STEEL

AVONDALE MARINE WAYS, INC. CABLE ADDRESS "AVONWAYS"

P. O. BOX 1030 • PHONE UNiversity 4561 • NEW ORLEANS 8, U. S. A.

Once it gets a foothold, fire rips into your plant like a monstrous claw. That means you must guard every hazard—flammable liquids, electrical equipment as well as ordinary combustibles—with Kidde Portable Extinguishers or Built-in Systems. Call your Kidde agent today.

Kidde

Walter Kidde & Company, Inc.
260 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

LETTERS
TO THE EDITORS

STEEL Goes to Belgium

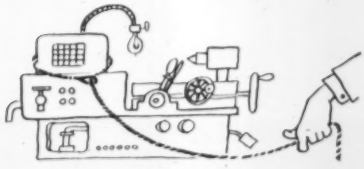
I have been told of the fine series of articles you ran entitled "STEEL's Program for Management" for 1953.

I would appreciate it very much if I possibly could get a copy of each article in the series. These, I am sure, would help me greatly in a project which I have just accepted. That is, I'm to be a member of a four-man team going to Belgium on Mar. 4 and spending four to five weeks in talking with Belgian businessmen in seminars about marketing research, sales problems and other management activities. From the individual titles in your series, I know that they contain a lot of useful material that could be passed along.

Donald E. West
director of marketing research
Redbook Magazine
McCall Corp.
New York

• *Sent.—ED.*

Leasing Capital Equipment



I would appreciate your sending me a tear sheet of your article "Leasing: A Competitive Vitamin?" (Oct. 19, p. 45).

F. Salditt, vice president
Harnischfeger Corp.
Milwaukee

• *Sent.—ED.*

Yearbook Still Popular

I have just finished reading the 1954 Metalworking Yearbook issue of STEEL (Jan. 4). This is really an excellent edition, packed with marketing news and many other features important to the metalworking industry.

J. A. Warren
Cincinnati Shaper Co.
Cincinnati

At the suggestion of your Washington editor, Mr. E. C. Kreutzberg, we are writing to learn if it is possible to obtain a copy of your Metalworking Yearbook issue (Jan. 4). This particular publication contains information which would assist our organization materially in carrying out our planning activities in the raw materials field.

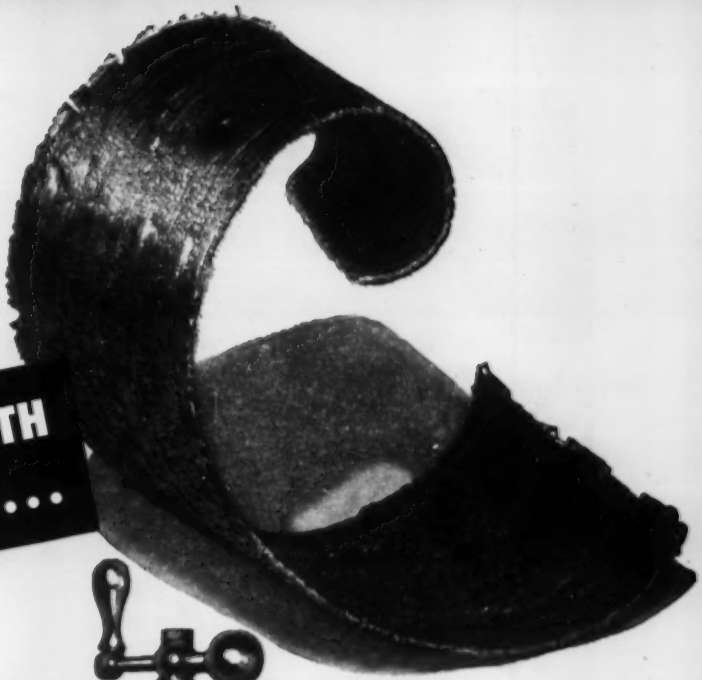
R. W. Green
Colonel, USAF
Department of the Air Force
Washington 25

Could you please supply me again this year with a copy of the "Metalworking Facts and Figures" section of your 1954 Metalworking Yearbook issue (Jan. 4)? I have found the information as compiled and presented in this yearly review of great help to me in my work

Please turn to p. 12

50 lbs. oil pressure

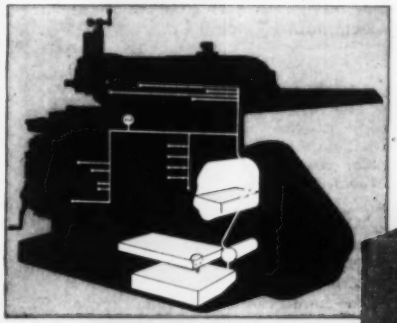
IS NECESSARY WITH A CUT LIKE THIS...



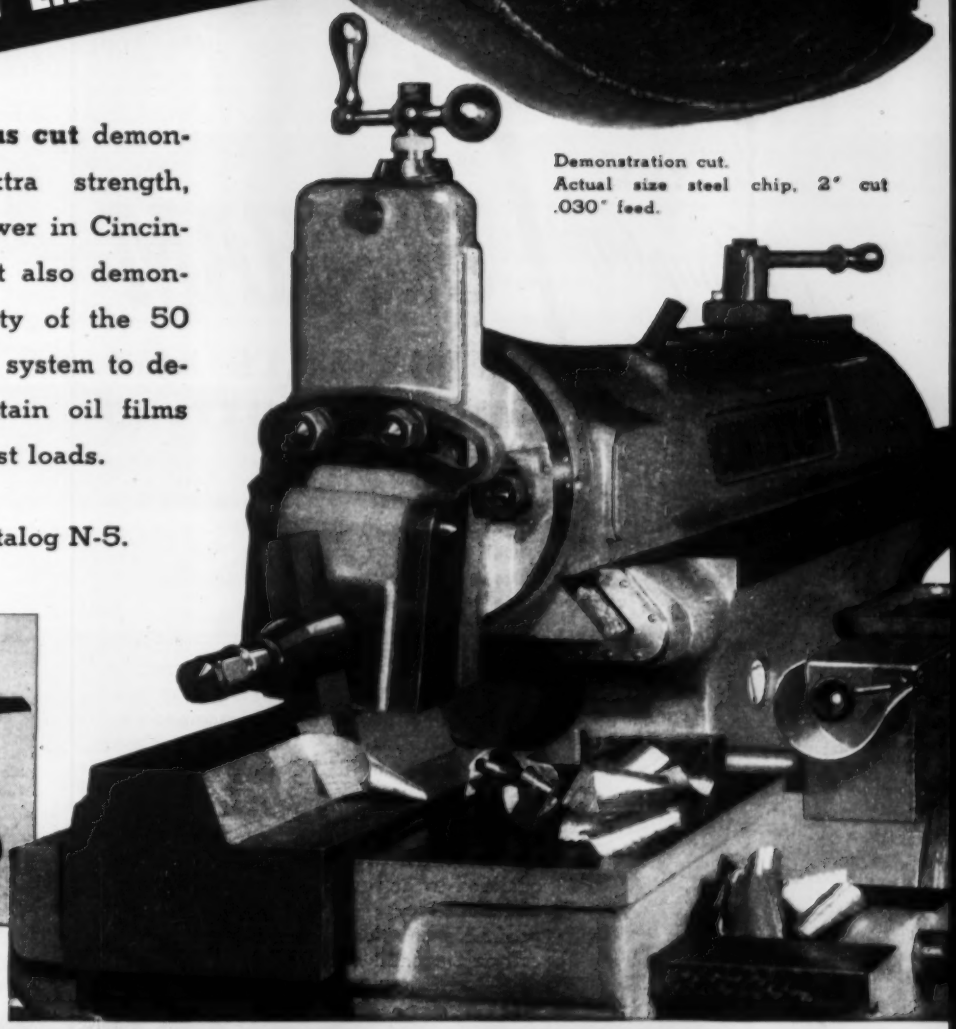
Demonstration cut.
Actual size steel chip. 2" cut .030" feed.

This tremendous cut demonstrates the extra strength, rigidity, and power in Cincinnati Shapers. It also demonstrates the ability of the 50 p.s.i. lubrication system to develop and maintain oil films under the heaviest loads.

Write for Catalog N-5.



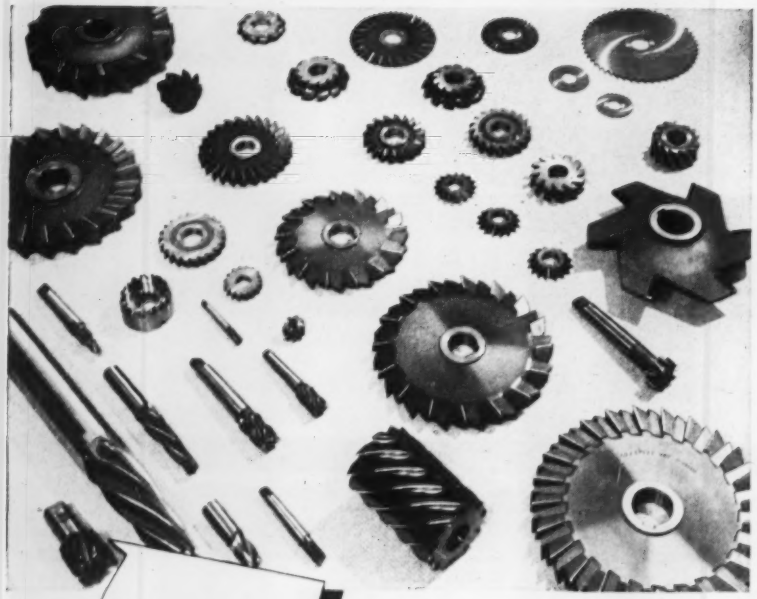
50 p.s.i. system includes 50 micro filter, settling basin and reservoir. Transmission runs submerged in oil.



CINCINNATI

THE CINCINNATI SHAPER CO.

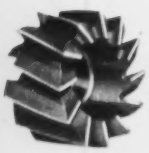
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES



THE *Complete Line*

GORHAM

END MILLS AND MILLING CUTTERS



For profitable solutions to production milling problems, call on Gorham! Over thirty years' experience in creating fine cutting tools is your assurance of satisfaction.

An extensive line of *standard* end mills and milling cutters is stocked by Gorham distributors. When you need *special* tooling, a Gorham Field Engineer surveys your problem and makes design recommendations for a tool to be "tailor-made" for your application by skilled Gorham craftsmen.

Ask your distributor for Gorham "standards." For "specials," call in your nearby Gorham Field Engineer. They're both well qualified to help you . . . and backed by unmatched experience and facilities. For profitable solutions to milling problems, call on Gorham! There's no obligation.

Write for free 120 page catalog. Shows entire line, contains valuable engineering information.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from p. 10

as an industrial specialist in the Office of Defense Mobilization.

Lester Tepper
Office of Defense Mobilization
Washington 25

If tear sheets are available of the "1954 Metalworking Facts and Figures" section, I will appreciate receiving a set for my reference files.

W. L. Graham
New Haven & Trenton Works
American Steel & Wire Division
U. S. Steel Corp.
New Haven, Conn.

• *Sent.—ED.*

Be Prepared for Fires

We appreciate your bringing the subject of fires to the attention of your readers in the article "The First 2 Minutes Count the Most" (Feb. 8, p. 112).

Just to prove that we read every word of it with interest we would like to call attention to p. 113 which refers to three kinds of extinguishing agents for class B fires, but actually lists four, including the vaporizing liquid type. The vaporizing liquid extinguishing agent, however, is not listed in the box at the left.

Truman Young
Pyrene Mfg. Co.
Newark, N. J.

• *Vaporizing liquid was not mentioned in the box because of space limitations. As you will note, it is headed common extinguishing agents which are suitable for the three classes of fires.—ED.*

Publishing and Publications

I have read with interest "Rollmaking Art Goes Modern" (Jan. 18, p. 82). As noted in that article, it was written from a book "Rolling Mills, Rolls and Rollmaking," published by Mackintosh-Hemphill Co. on the occasion of its 150th anniversary. I would like to know how to obtain this publication of the Mackintosh-Hemphill Co.

Theo G. Hagen
J. H. Day Co. Inc.
Cincinnati

• *Our article was extracted from a proof copy of the book which has not yet been published. When the book is available, copies can be secured from the Mackintosh-Hemphill Co.—ED.*

We are in the process of revising and reprinting copyrighted textbooks used in conection with our graduate study program.

In connection with this revision of material, we would like to include in the text "Steel Plant Design — Steel Melting Furnaces" the following materials which you have published:

Reproduction of figures showing Single Deck Reversing Valve, Double Deck Reversing Valve and Hellan Reversing Valve Design given in the article "Progress in Open Hearth Valve Design" (Feb. 9, 1949, figures 113, 114, 115).

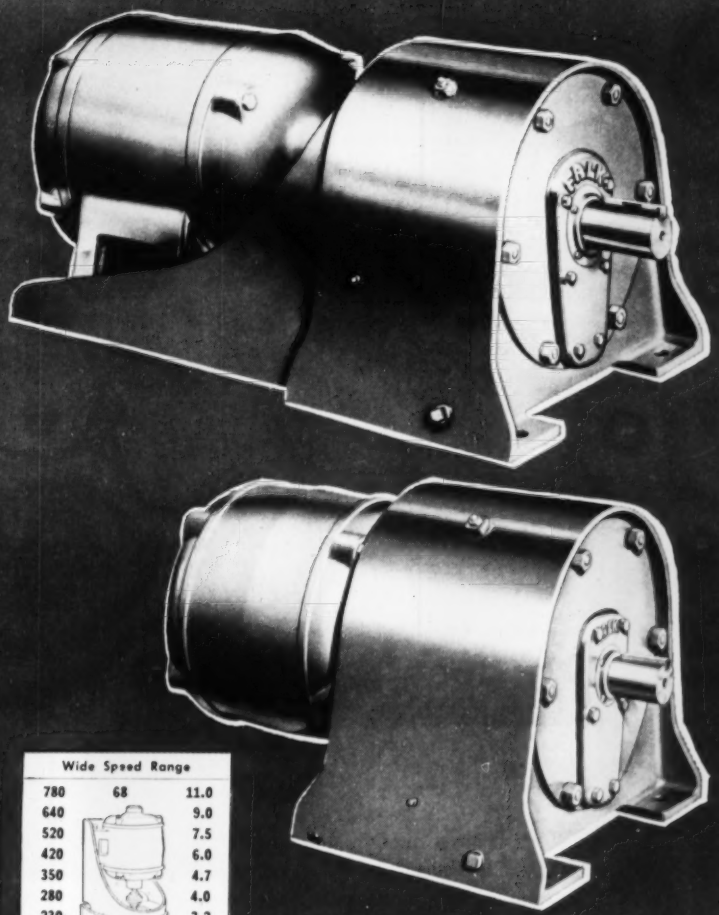
W. P. Jones, director
superintendent
Education and Training
U. S. Steel Corp.
Pittsburgh

Both... All-Motor and Integral

ALL-STEEL FALK Motoreducers

use *complete* motors with *no* modifications

...another important reason why you should consult FALK!

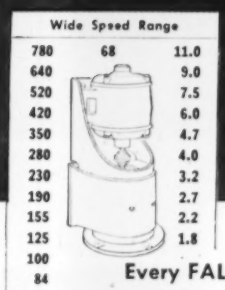


You never have the annoying problem of motor modification when you standardize on *all-steel* FALK Motoreducers. Both the universally popular All-Motor type and the newly redesigned Integral type use *completely standard motors without modification.* The motor can be quickly and easily replaced by another standard motor of any make, type or speed within the unit's AGMA rating when necessary without disturbing the reducing unit.

Many users choose the All-Motor type because it permits easy interchange of motors, *or even parts,* on the job, *in minutes*—and because reducer units and/or motors may be readily transferred from one line or plant location to another. Other users select the new Integral type with standard D-flange NEMA motor because it is a highly compact, streamlined unit providing the utmost in space economy.

In every FALK Motoreducer—All-Motor or Integral—the output speed (ratio) can be changed within the unit's torque capacity without modifying the motor.

Both types give you all the quality, adaptability, dependability and long-range economy for which FALK has been celebrated for more than sixty years. FALK Motoreducers are available from factory, field or distributor stocks throughout the country. Write to Department 247.



Every FALK Motoreducer has these "In-built" Factors—

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

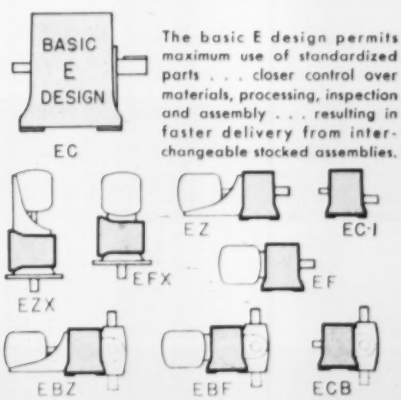
Sealed Housings. Dual closures and one-way vents keep oil *in,* dust and moisture *out.* Units are splash-proof, leakproof, dustproof.

Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

Streamlined inside and outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

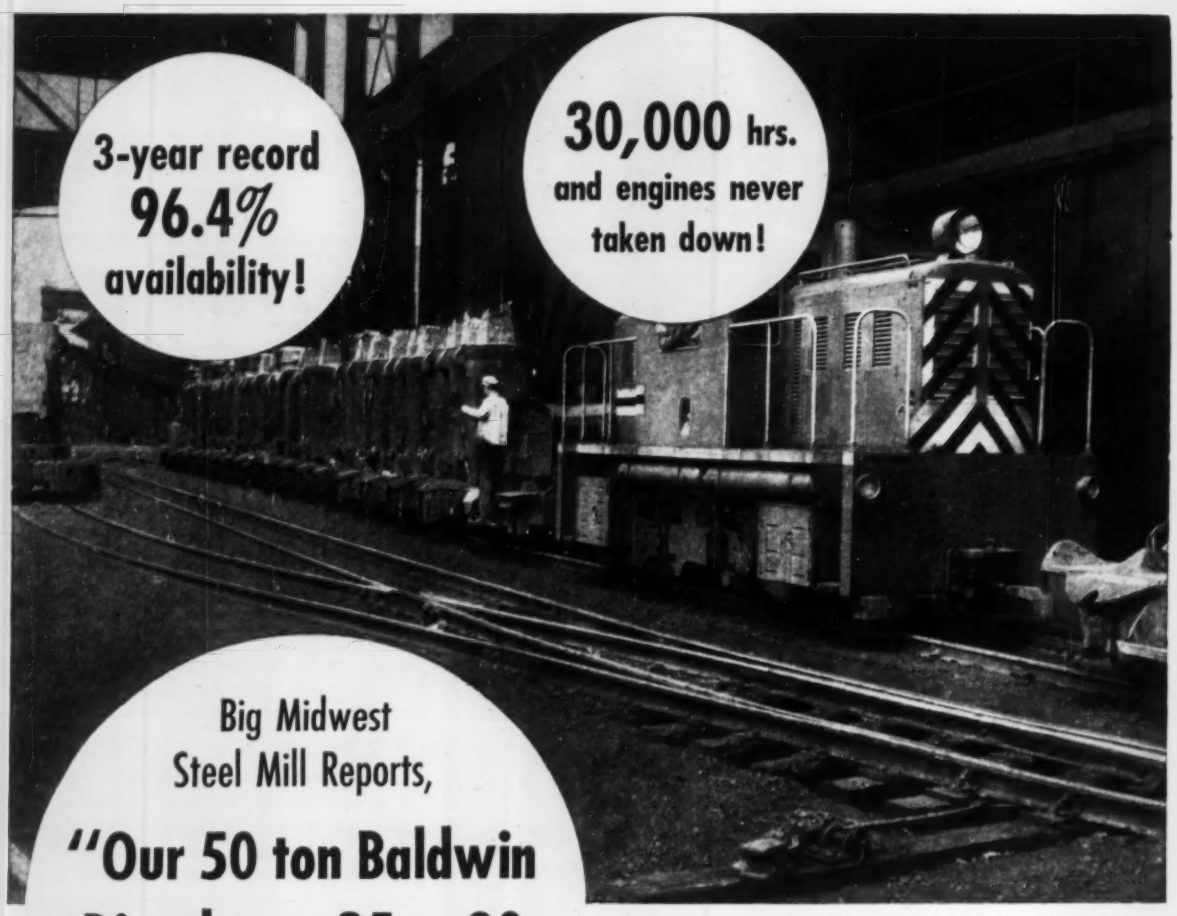


The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.

FALK ...a good name in industry

THE FALK CORPORATION 3001 W. Canal St. Milwaukee 8, Wis.

WRITE TO DEPARTMENT 247



Big Midwest
Steel Mill Reports,

"Our 50 ton Baldwin Diesel gets 25 to 30 heats out on time every day!"

When it costs hundreds of dollars for every delay of a minute in getting a heat out and the ingots to the blooming mills and soaking pits, efficient, dependable locomotives are indispensable to a steel mill. A major steel mill in the midwest reports a remarkable record of money-saving performance by their Baldwin industrial diesel-electric locomotive:

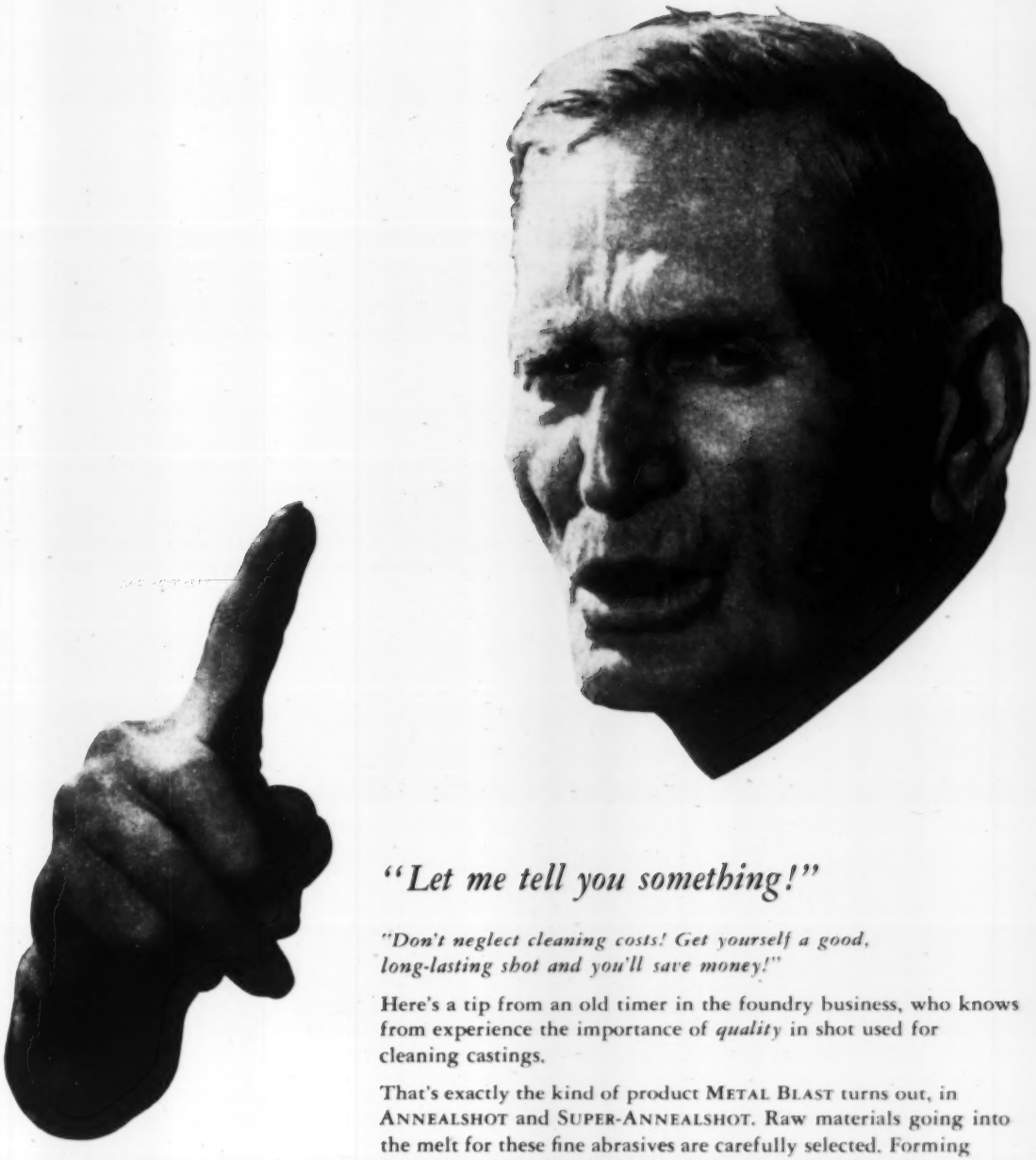
"Our 50-ton Baldwin replaced two steam locomotives on the hot line moving ingots to the blooming mills and soaking pits. We tap 8 to 10 heats a shift, three shifts a day. The heats run as much as 150 tons, making many of the loads for the Baldwin 594 tons which theoretically would require a 32% heavier diesel. But this Baldwin has handled *every* job 24 hours a day for over 3 years in spite of the extreme heat, bad curves and rough track conditions on this run. It is taken off the job each week two hours for inspection and lubrication. No major repairs have been necessary during 30,000 hours of operation."

In mine or mill, you, too, can depend on similar economy and dependability by switching to and with Baldwin Industrial locomotives.

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN – LIMA – HAMILTON

INDUSTRIAL LOCOMOTIVES



"Let me tell you something!"

"Don't neglect cleaning costs! Get yourself a good, long-lasting shot and you'll save money!"

Here's a tip from an old timer in the foundry business, who knows from experience the importance of *quality* in shot used for cleaning castings.

That's exactly the kind of product METAL BLAST turns out, in ANNEALSHOT and SUPER-ANNEALSHOT. Raw materials going into the melt for these fine abrasives are carefully selected. Forming and heat treating equipment is modern and efficient. Production operations are rigidly controlled. So, METAL BLAST is confident it is offering the very finest shot in the market.

If this fits your thinking, call in your METAL BLAST representative or write direct to **METAL BLAST, Inc.,** 872 East 67th St., Cleveland 3, Ohio.

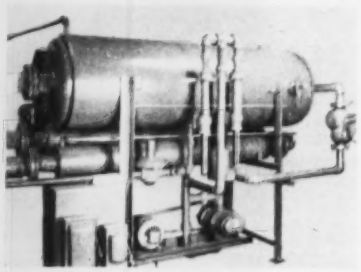
METAL BLAST ANNEALSHOT
chilled shot and grit

SUPER-ANNEALSHOT
malleable shot and grit

Both lean *and* rich gas ratios

S&W

HORIZONTAL TYPE EXOTHERMIC ATMOSPHERE GENERATORS



Answer *all* your standard requirements for bright or clean annealing and sintering. The Sargeant & Wilbur exothermic gas generator produces the controlled atmosphere you need — maintains constant gas mixture, lean or rich. Firing may be with manufactured, natural, propane or butane gas. Assured economy features are low maintenance cost, long satisfactory service life. S & W gas generators, both exothermic and endothermic types, are regularly supplied as standard units in capacities from 125 to 5000 C.F.H. Larger sizes will be made up readily to your order — and good service on all orders is our regular routine. To compare S & W performance, send your samples for processing — without obligation.

Have Samples Processed Free

Find out how satisfactorily the S & W Exothermic Generator will do your own work — bright or clean annealing of low carbon steel, copper and copper alloys; sintering of low carbon iron or non-ferrous mixtures in powder metallurgy. Just send us samples and specifications. Prompt follow-through — no obligation.

S&W

Write today for details on S & W gas generators. Just state your regular requirements—we'll supply the facts.

SARGEANT & WILBUR, INC.
182 Weeden Street, Pawtucket, R. I.

Complete Line of Electric and Fuel-Fired Furnaces To Meet Every Industrial Need
Atmosphere Generators
Ammonia Dissociators
Gas Conditioning Equipment

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THE WEEKLY MAGAZINE OF METALWORKING

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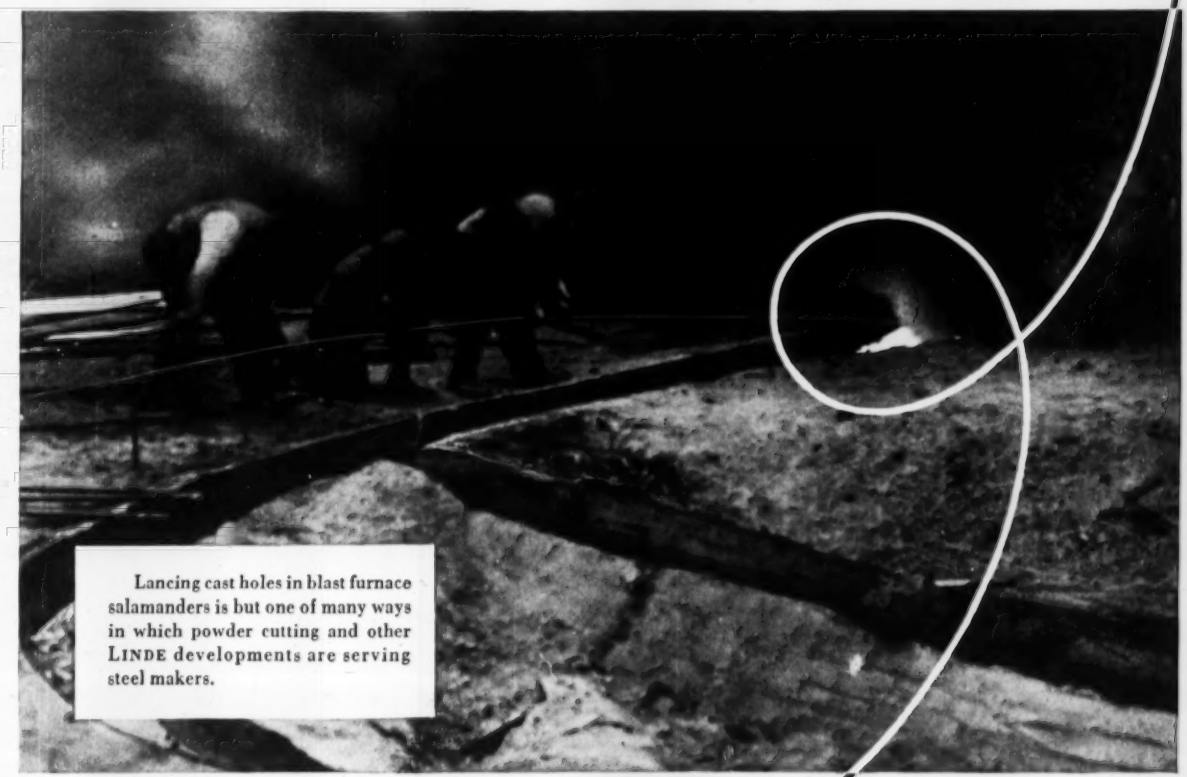
How Oxygen...and LINDE SERVICE* GOT A STEEL MILL "OUT OF THE WOODS"



Lancing cast holes in blast furnace salamanders is but one of many ways in which powder cutting and other LINDE developments are serving steel makers.

Costly downtime was piling up in a large steel mill. Usual methods of tapping a blast furnace salamander wouldn't work. It looked like the furnace would be down for some time.

Then LINDE SERVICE was called in. Powder cutting for lancing a cast hole in the furnace was recommended. LINDE-trained operators began powder cutting at 1 a.m. Five hours later, the 225-ton salamander was out of the furnace.

"Thank you for your help during our recent blast furnace difficulties," a mill official wrote. "We are now out of the woods, thanks to the help of your operators and the powder lance."

Today, the LINDE powder lance is standard equipment in that mill.

If your company uses oxygen, LINDE SERVICE can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street New York 17, N. Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company
Division of Union Carbide Canada Limited

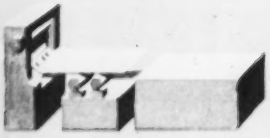
***LINDE SERVICE**

is the unique combination of research, engineering, and more than 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

Linde
Trade-Mark

problem....HOW TO CUT STEEL COSTS

Both systems begin with mill coil. However, if you are now buying sheet you are faced with the following costs.



For mill cutting to random lengths, simply shearing to reach sheet form, add **$.10** per hundred weight to basic steel cost.

For squaring to tolerance at the mill add another **10 percent** to your basic steel costs.

Then for wrapping and palletizing to keep the sheet clean and easy to warehouse **add an additional $.025** to the costs.

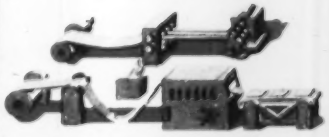
The steel, of course, must be delivered regardless of form.

solution....A WEAN SLITTING and SHEARING

With the Wean system you buy coils, simply prepared . . . eliminate mill extras. Delivery is of comparatively few width sizes.

The fewer sizes . . . the smaller purchasing and inventory staffs required.

And you save approximately 30 percent in storage area.



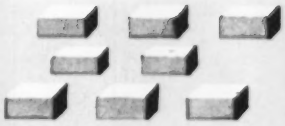
The Wean Line converts the coil of steel to resquared multiples at rates up to 200 feet (or 100 cuts) per minute. Tolerance control is easily held within accepted

Actual Savings in Steel Costs of 20%

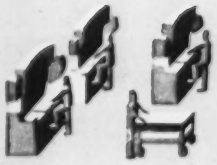
To many steel fabricating people this amazing speed of cutting-to-length to resquared tolerances has seemed unbelievable. But, to many others, who have seen one of these Wean lines in operation, talked with people who operate them, gone over actual figures, this is a production line "must".

When we say savings up to 20 percent in your steel costs we mean just that. Total up the costs approximated above . . . check them against the book . . . against your own cost sheets. Find out what you're paying for getting steel from coil to final sheet size, ready to form. If it's more than a dime a hundred weight then you should know all about the Wean line. Get in touch with one of the offices listed below and let a qualified Wean representative work with you — using your figures if you wish — in proving the Wean line can effect a substantial savings where you and your operations are concerned.

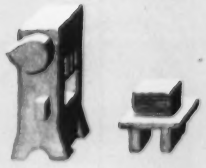
Where you're buying sheets of various sizes you'll require about **30 percent more help** in your purchasing and inventory control departments.



And about **30 percent more space** in your warehousing set-up.

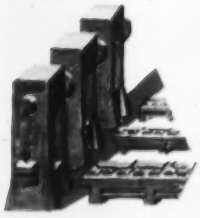


Then, if you further resquare to multiples in your own plant you're paying an **additional cost of at least $.35 per hundred weight.**



Thus, prior to fabrication, you have added approximately $1.00 to every hundred pounds of steel, even though you are using plain light gauge metal.

LINE



range. *The entire "extra" cost prior to fabrication here . . . just a fraction of the $1.00 plus per hundred weight cost of standard methods.*

Wean

COMBINATION SLITTING and SHEARING SYSTEMS

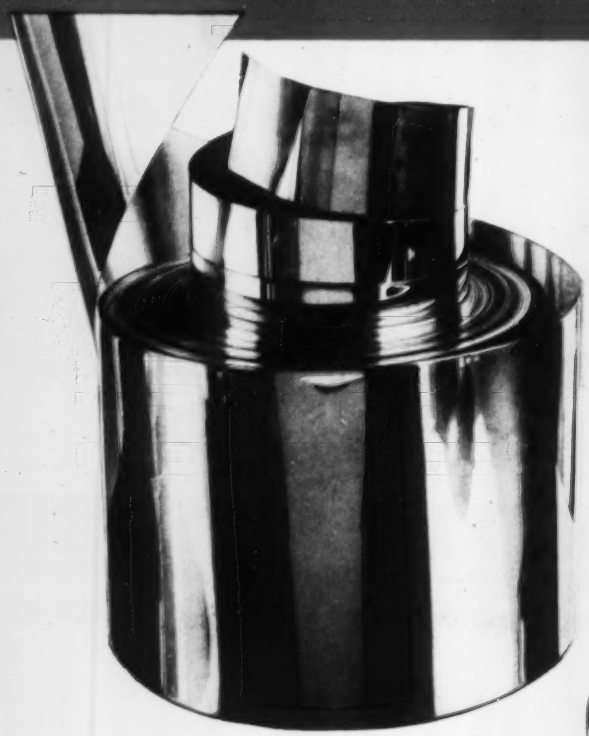
WEAN EQUIPMENT CORPORATION OFFICES

CLEVELAND

CHICAGO NEWARK, N. J. DETROIT

Cable Address: WEANCOR

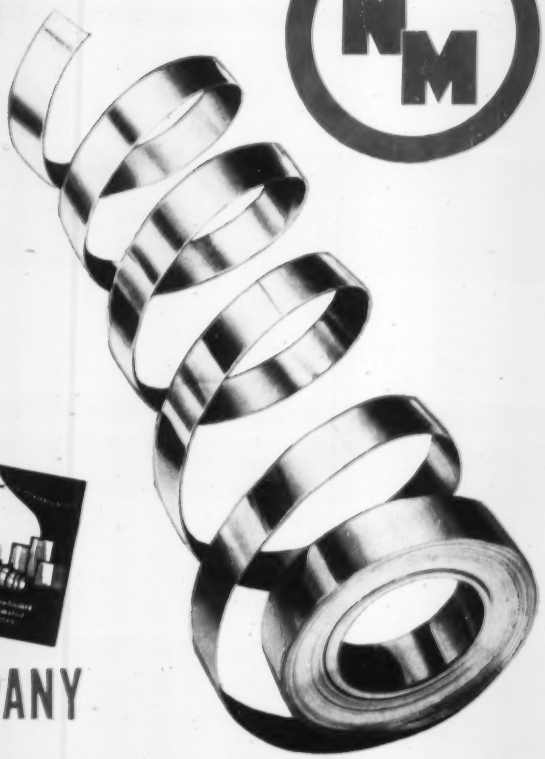
NICKELOID METALS STARTING POINT FOR PRODUCT DESIGN



MORE THAN A METAL, IT'S A METHOD

Nickeloid Metals—brilliant pre-finished metals in sheets or coils—are ready-plated with the finest, quality plating of chromium, nickel, copper or brass. Being finished, they are ready for fabrication and assembly. They require no further finishing. They are durable, easy to fabricate. Nickeloid Metals provide a production short-cut that usually provides a basic economy in cost. Thus Nickeloid Metals are more than a raw material . . . they represent a streamlined method of production: raw material to finished part. Many operations are eliminated or short cut. Nickeloid Metals deserve further study on the part of every progressive manufacturer.

Nickeloid pre-plated finishes available in these base metals: Steel, Zinc, Brass, Copper, or Aluminum.



CREATES A NEW SALES APPEAL

The appeal to the buyer of products that have that smart, modern finish, is undeniable. The list of successful applications that have employed Nickeloid Metals to enhance eye appeal is long. From buttons to rotisseries . . . smart designers and alert manufacturers are cashing in on the basic production economy and sales appeal offered by these pre-plated metals. Our representatives, located in most principal cities, will be glad to show you samples of successful applications. They will be glad to submit working samples of metal for experimental purposes. They will be glad to give you the benefit of Nickeloid's half century of experience in the fabrication of these brilliant, gleaming, durable metals.

Write for new Booklet covering properties, uses and fabrication techniques for Nickeloid Metals.

Quality Metals Since 1898

AMERICAN NICKELOID COMPANY

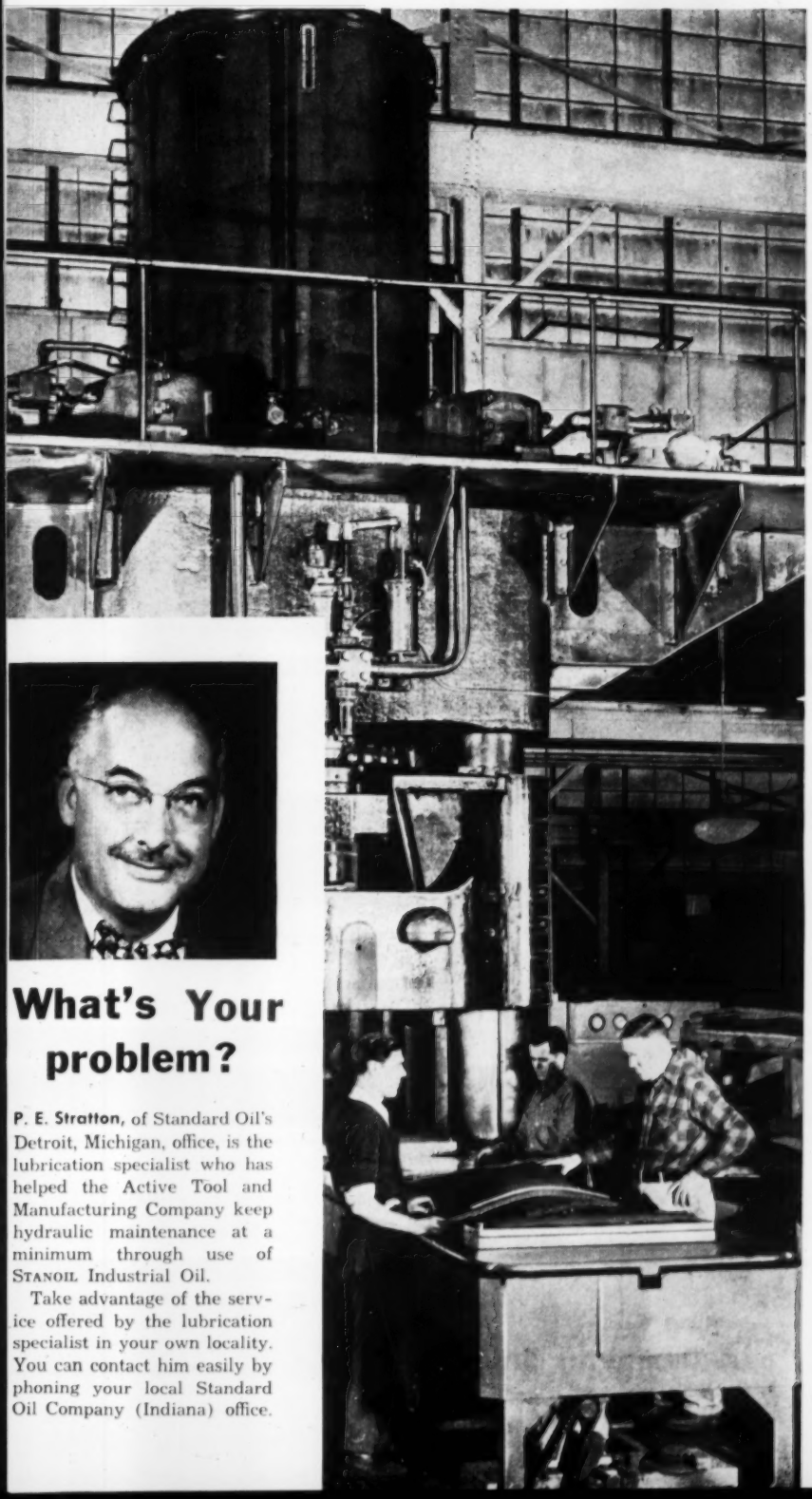
PERU 1, ILLINOIS

MILLS: PERU, ILL. and WALNUTPORT, PA.

Sales offices in most principal cities

STANOIL
TRADE MARK
Industrial Oil

How they keep hydraulic maintenance to a minimum



What's Your problem?

P. E. Stratton, of Standard Oil's Detroit, Michigan, office, is the lubrication specialist who has helped the Active Tool and Manufacturing Company keep hydraulic maintenance at a minimum through use of STANOIL Industrial Oil.

Take advantage of the service offered by the lubrication specialist in your own locality. You can contact him easily by phoning your local Standard Oil Company (Indiana) office.

● Officials of the Active Tool and Manufacturing Company, Detroit, Michigan, count on trouble-free hydraulic operation of this giant press. They place much of their confidence in the performance of STANOIL Industrial Oil—and with good reason.

Recommended by a Standard Oil lubrication specialist, STANOIL has served in the hydraulic system of this press for over four years. In all of that time, it has not been necessary to replace the original fill of oil nor has the hydraulic system once needed to be cleaned. Periodic tests of oil samples have shown that STANOIL, despite hard service and high oil-operating temperatures, has maintained a lubricating quality comparable with new oil.

You, too, can rely on this unique, versatile oil to give you clean, dependable service, in a wide variety of equipment. The Standard Oil lubrication specialist serving your area of the Midwest will be glad to show you operating records covering the many applications of STANOIL. Phone him at your local Standard Oil office. Or, write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY

(Indiana)

Rubbish Disposal is only ONE of the Cost Cutting jobs for the Dempster-Dumpster in your plant...

It's amazing, almost to the point of fantasy, yet so soundly real, what the minds of men in all types of industry have cooked up for more efficiency and reduced costs with the Dempster-Dumpster.

Hundreds of plants are handling materials of practically every description with one truck-mounted Dempster-Dumpster serving scores of detachable containers. Here are just a few. Oils, gases, and liquids handled in our Tank Type Containers . . . tools and equipment in our Tool Shed Type Container . . . containers on casters placed for receiving steel chips from lathes or at conveyors for receiving finished products . . . container with doors and windows, replacing shacks for plant guards or nightwatchmen . . . containers built to handle chlorinator ash residue of approximately 1500° F. and there are dozens more.

Containers are placed wherever material accumulates. When loaded each is picked-up, hauled and emptied (as illustrated above) . . . or load set down intact. The entire operation is handled by only one man, the driver, by hydraulic controls in cab.

The containers are built in capacities up to 12 cu. yds. and each is designed to suit the materials to be handled—be they bulky, light or heavy . . . solids, liquids or dust.

One Dempster-Dumpster, with driver, does the work of 3 to 5 conventional trucks . . . eliminates trucks and crews standing idle . . . eliminates rehandling of materials and increases efficiency and good plantkeeping.

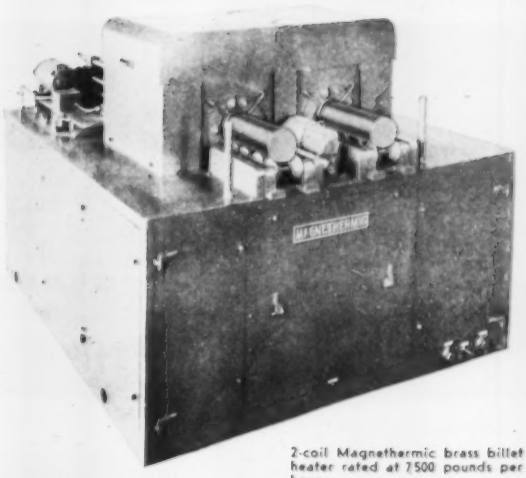
If you have even any remote idea that this equipment could be adapted to your operation, by all means contact us because being without the Dempster-Dumpster System could easily be costing your company thousands of dollars annually. Manufactured and sold exclusively by Dempster Brothers, Inc.

DEMPSTER BROTHERS, 642 Dempster Bldg., Knoxville 17, Tennessee

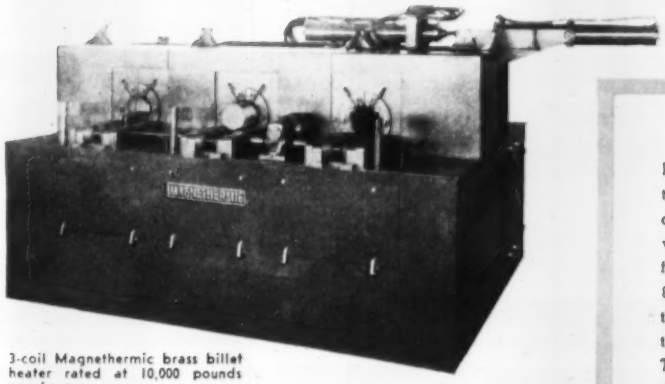
Induction Heaters for Brass and Copper Billets

REDUCE OPERATING COSTS

Magnethermic 60-cycle brass and copper billet heaters, now in operation, prove that they do reduce operating costs. Billets are heated in two or three minutes rather than hours. Temperature control is extremely accurate . . .each billet is discharged at exactly the same temperature. No warm-up time is required. On initial start ups, press the button, and in two or three minutes, heated billets are ready for further processing. No need to schedule billets ahead of time. Not more than three billets are in process at any one time.



2-coil Magnethermic brass billet heater rated at 7500 pounds per hour.



3-coil Magnethermic brass billet heater rated at 10,000 pounds per hour.

MAINTENANCE

Furnace damage is caused by heat. In a typical Magnethermic heater, the heating chamber is a tube 8" in diameter, 24" long, and water cooled for long life. In a conventional furnace, the heating chamber may be 40 ft. long, 8 ft. wide and 3 ft. high. It stands to reason that the latter will require many times the maintenance that the induction coil requires. Then too, no need to shut down when relining the coil. Operate on the other coils, or put in a spare coil. Coils can be changed in ten minutes and relined in an hour or two.

ALL SIZES

Magnethermic makes a single, two, or three-coil heater for any production requirement needed. All heaters are shipped completely assembled. Installation cost is at a minimum. Working conditions are ideal and floor space is negligible.

Heaters will operate equally well on extrusion billets, piercer billets, or wire bars. If you have a heating problem, let one of our engineers discuss it with you. A letter or phone call will receive prompt attention.

60-CYCLE

MAGNETHERMIC®

corporation

3990 SIMON ROAD YOUNGSTOWN 7, OHIO

INDUCTION HEATING

Choose from 20,000 shapes and sizes

REPUBLIC BOLTS, NUTS, SCREWS, RIVETS

● More than 20,000 regular items are made and stocked by Republic. They are uniform in size, accurately threaded, easy to assemble, tough and strong to withstand shock and vibration.

Highest quality steel, modern plant facilities and equipment, rigid control at every step of production assure you of long-lasting, top-quality fasteners. Depend on Republic for complete coverage of all your fastener requirements.

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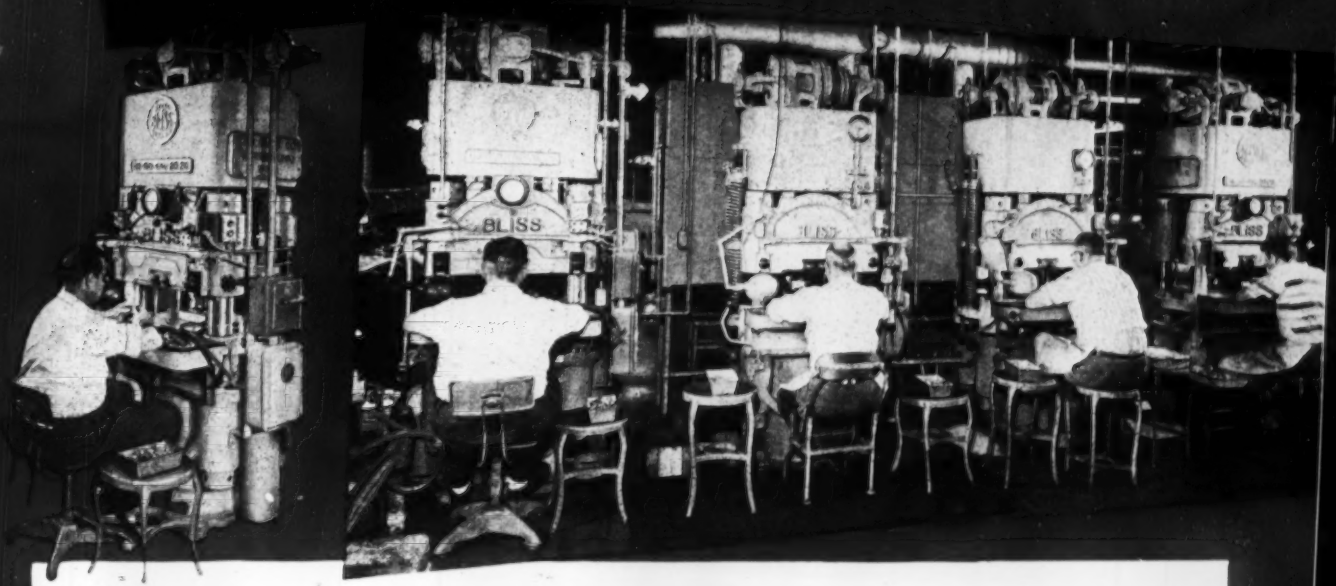
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC *Upson Quality* REPUBLIC STEEL
BOLTS AND NUTS

For HYDRAULIC presses, too . . .
it pays to specify BLISS



Gruen obtains MICRO-PRECISION accuracy with

BLISS HYDRO-DYNAMIC PRESSES

Accuracy is the keynote of operations at the Gruen National Watch Case Company, Cincinnati, Ohio. This is especially true in the forming of the case itself. Here, tolerances are critical—with an exact fit of the crystal inside the watch case essential to keep it from falling out. Gruen prefers the Bliss Hydro-Dynamic presses for this job—holding tolerances to several ten-thousandths of an inch.

Equipped with high- and low-pressure pumps, these Bliss Hydro-Dynamic presses are the moving-up type . . . especially suited to industries employing sub-die processes. Their efficient, accurate operation is typical of results obtained with Bliss Hydro-Dynamic presses in all types of plants. At Gruen, *72% of the presses are Bliss-built.*

Let Bliss, the world's largest press builder, apply its long experience to *your* next press problem. Talk it over with a Bliss sales engineer. He can help you select the right press for your special requirements. Meanwhile, for more detailed information about Bliss Hydro-Dynamic presses, write for Catalog 30-A.

BLISS on your press is more than a name . . . it's a *guarantee*

E. W. BLISS COMPANY, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Subsidiary: The Bliss-Fenton Company, Detroit, Mich. • E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Pacific Coast), Los Angeles and San Francisco

U. S. Plants in Canton, Salem and Toledo, Ohio and Hastings, Michigan; San Diego Col. Branch Offices in Chicago, Cleveland, Dayton, Detroit, Philadelphia, New Haven, New York, Pittsburgh, Rochester, Toledo and Toronto, Canada. West Coast Representatives: Rivett Machinery Co., Los Angeles and San Francisco; Bliss Machinery Company, Seattle. Other representatives throughout the world.

Today you may have your new Ederer Industrial Crane Catalog by simply addressing your request on your company letterhead to Ederer Engineering Company 2935 First Avenue South Seattle 4, Washington

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CALENDAR
OF MEETINGS

February 22-25, Annual Industrial Ventilation Conference: Kellogg Center, Michigan State College, East Lansing, Mich. Information: Continuing Education Service, Michigan State College, East Lansing, Mich.

March 1-5, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy and Exposition of Modern Laboratory Equipment: Hotel William Penn, Pittsburgh. Information: L. D. Frederickson Jr., P. O. Box 772, New Kensington, Pa.

March 3, Steel Kitchen Cabinet Manufacturers Association: Spring meeting, New York. Association address: Engineers Bldg., Cleveland 14. Executive secretary: Arthur J. Tuscany Jr.

March 3-4, American Machine Tool Distributors Association: Spring meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

March 4-5, American Society for Metals: Mid-winter meeting, Hotel Statler, Boston. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

March 8-12, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 9-12, American Management Association: General management conference, Fairmont hotel, San Francisco. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

March 10-12, Society of the Plastics Industry Inc.: Pacific coast section conference, Hotel del Coronado, Coronado, Calif. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 10-12, American Society of Mechanical Engineers: International meeting, Hotel Del Prado, Mexico City, D. F. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

March 15-17, National Association of Waste Material Dealers Inc.: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

March 15-19, National Association of Corrosion Engineers: Annual conference and exhibit, Municipal Auditorium, Kansas City, Mo. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

March 15-19, National Association of Manufacturers: Institute on Industrial Relations, Hollywood Beach hotel, Hollywood, Fla. Association address: 14 W. 49th St., New York 20. Director, Employee Relations Division: Sybil S. Patterson.

March 16-17, Engineering Institute on Industrial Ventilation: University of Wisconsin, Madison 6, Wis. Information: Professor Ray C. Tegtmeyer, Stadium Offices, University of Wisconsin, Madison 6, Wis.

March 16-17, Steel Founders' Society of America: Annual meeting, Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Executive vice president: F. Kermit Donaldson.

March 17-19, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland. Managing director: O. B. Werntz.

March 18-19, American Management Association: Special Conference on employee group benefits, Hotel Roosevelt, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

March 19-20, Machinery & Allied Products Institute: Fourth session, seventh conference on capital goods economics, Greenbrier Hotel, White Sulphur Springs, W. Va. Information: Secretary, Charles W. Stewart, 1200 18th St. NW, Washington 6.

March 23-25, Steel Shipping Container Institute Inc.: Annual meeting, Biltmore hotel, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

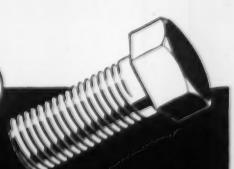
Now available... for immediate delivery

It's no longer necessary for your customers to run the risk of production delays when waiting for delivery on special order large size hexagon screws. Western's greatly extended stocks, in both bright and hi-carbon heat treated items, now include lengths up to 15 inches and diameters to 1½ inches. Most important, they are available for *immediate* delivery.

If your customer's specifications call for non-listed or special thread lengths, Western has on hand an extensive stock of blanks in these large diameters. In just a short time, these blanks can be accurately cut and precision threaded.

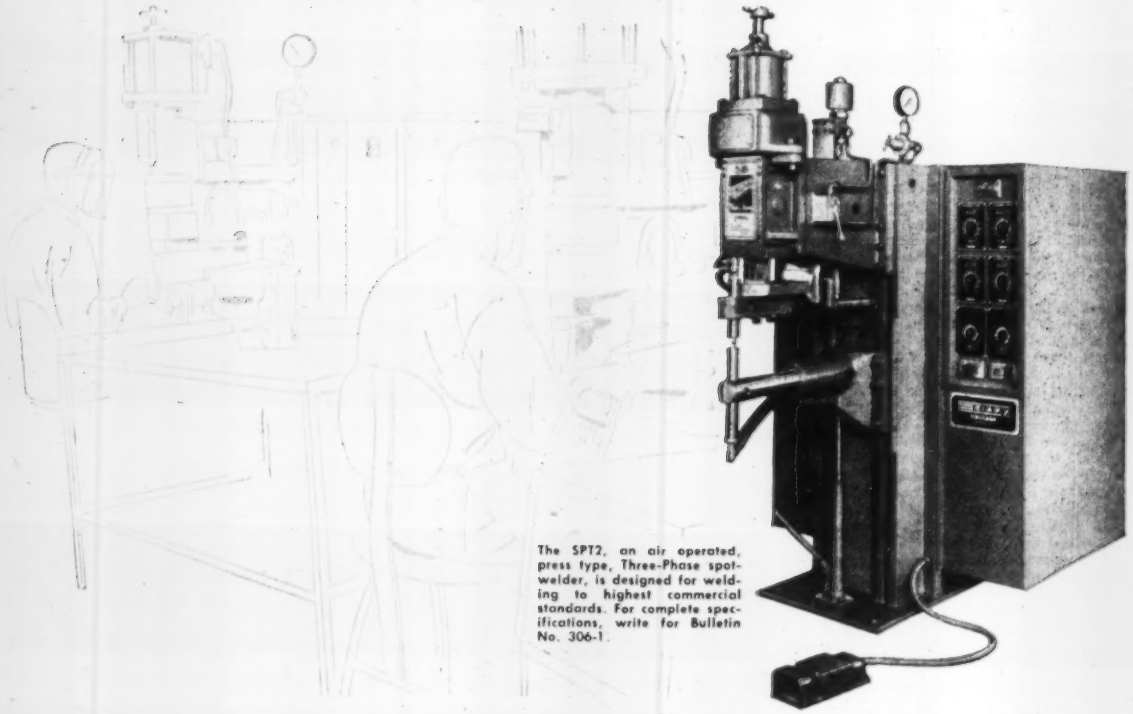
Whether your customer's product requires hexagon cap screws as small as ¼" x ⅜" or as large as 1½" x 15", Western Automatic's complete stock guarantees them the quick delivery and fast service that means more profitable production.

Western Automatic
Machine Screw Company
377 Lake Ave., Elyria, O.



Precision Screw Products, Parts and Assemblies Since 1873

YOU CAN USE
STANDARD SPOT WELDERS
FOR SPECIAL APPLICATIONS



The SPT2, an air operated, press type, Three-Phase spot-welder, is designed for welding to highest commercial standards. For complete specifications, write for Bulletin No. 306-1.

Three Standard Sciaky Three-Phase Machines Simplify Complications of Welding Bumper Guards

Grand Rapids Metalcraft, a Division of F. L. Jacobs Co., consulted Sciaky about special machines for resistance welding two mounting brackets in automobile bumper guards. Definite requirements of strength, outside appearance, and production were complicated by limited power facilities.

After careful examination of the problems, Sciaky engineers adapted completely standard spot welders with simple tooling.

Sciaky patented Three-Phase Principle of operation with balanced line load, near unity power factor, and reduced KVA demand readily satisfied limited power facilities, where conventional single phase would not.

Not only did the strength of spotwelded assembly exceed requirements, but Sciaky Three-Phase operation eliminated need for special metal finishing.

Compared to previous method of arc welding, production soared . . . a fraction of the equipment and floor space was needed . . . three unskilled workers replaced many highly skilled men . . .

Write for the complete story of Grand Rapids Metalcraft's use of standard Sciaky welders for this job. Ask for "Resistance Welding at Work," Volume 3, No. 8.

Largest Manufacturers of Electric Resistance Welding Machines in the World

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Plants: Chicago • London • Paris Sales Offices: Chicago, Ill. • Buffalo, N. Y. • Cleveland, Ohio • Dayton, Ohio • Detroit, Mich. • Ft. Worth, Texas • Hollywood, Calif. • New York, N.Y. • Philadelphia, Pa. • Washington, D.C.

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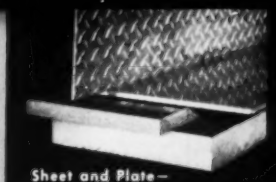
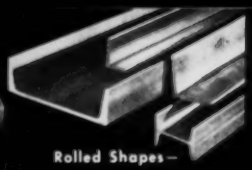
MILL PRODUCTS
The most complete line in Aluminum


Sheet and Plate—

Wire and Rod—

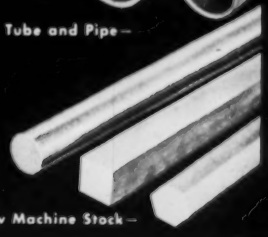

Rolled Shapes—

Tube and Pipe—

Bar Stock—

Fasteners—

Welding and Soldering—


Screw Machine Stock—

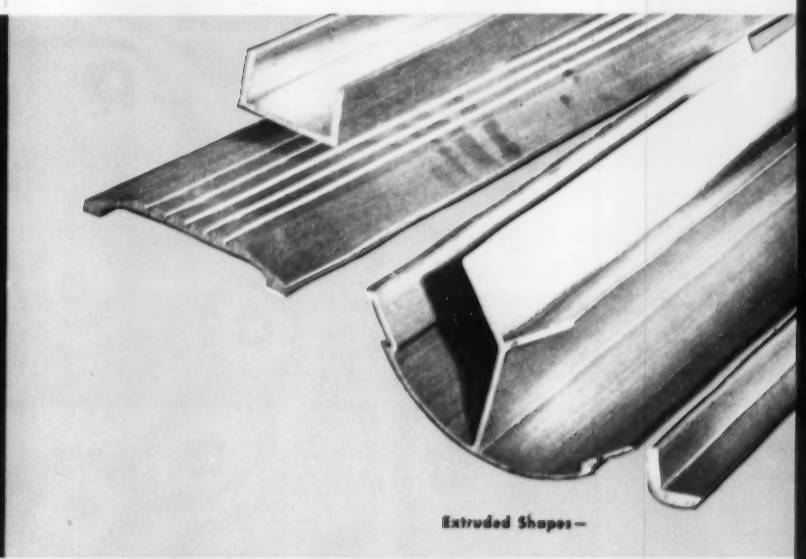
Built-up parts are no bargain; riveting and welding demand too many costly man-hours.

That's why production costs drop when you use aluminum extruded shapes. They take the handcuffs off your designer and allow him to distribute the metal where it's needed. Parts that would be prohibitively expensive to produce by assembly become practical. And while extrusion is not a precision process, tolerances are so close that only surface finishing is ordinarily required. Lengths run to 80 feet, maximum weights up to 600 pounds per piece.

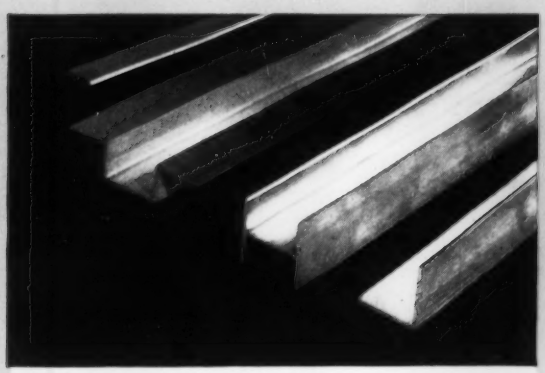
Alcoa operates the world's largest light metal extrusion facilities with 50 presses in five plants. With the experience of 50 years to draw on, Alcoa can show you how to take advantage of a broad line of standard extruded shapes or help you design for your own specialized requirements.

Alcoa Extruded Shapes

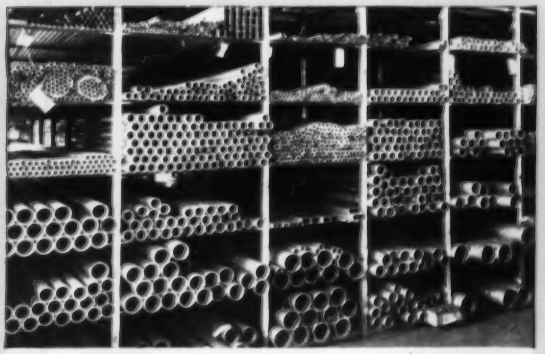
Can put the metal where you want it without time-consuming, costly assembly.


Extruded Shapes—

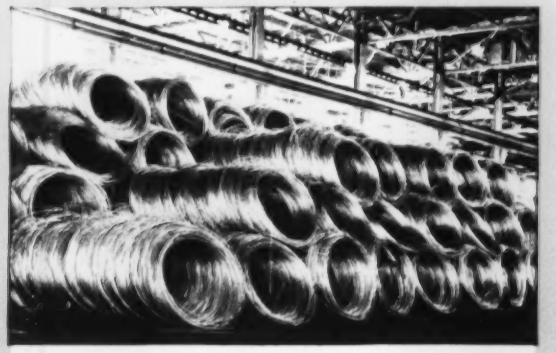
Products of Sixty-Five Years of Pioneering in Aluminum



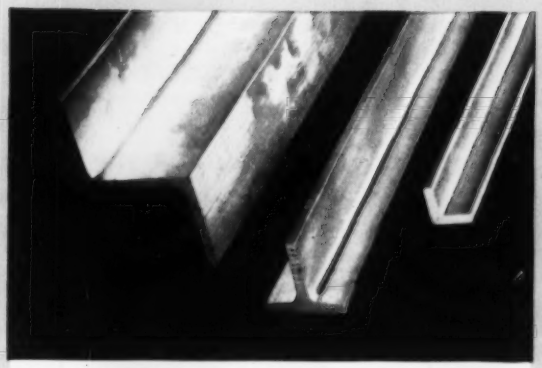
EXTRUDED SHAPES: For thresholds; window sills; door frames; glass stops; copings; gravel stops; trim; truck bodies. Also angles; channels; tees; zees; etc., for structures.



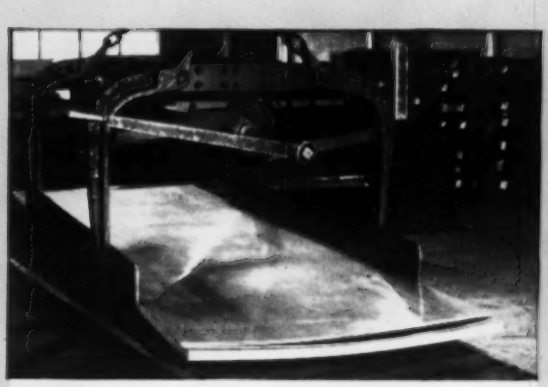
TUBE AND PIPE: Coiled tube; Utilitube®; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; construction pipe; rigid conduit.



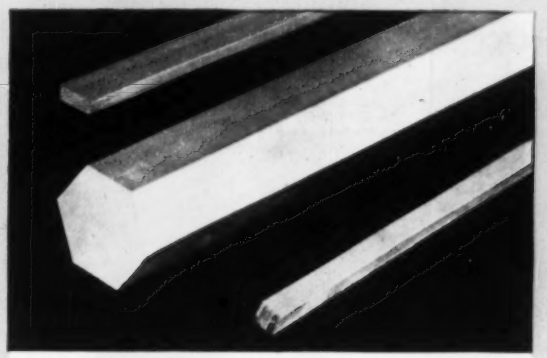
WIRE AND ROD: Coiled and straight length; flattened wire; rivet wire and rod for die heading operations in manufacture of rivets, nails, bolts and screws.



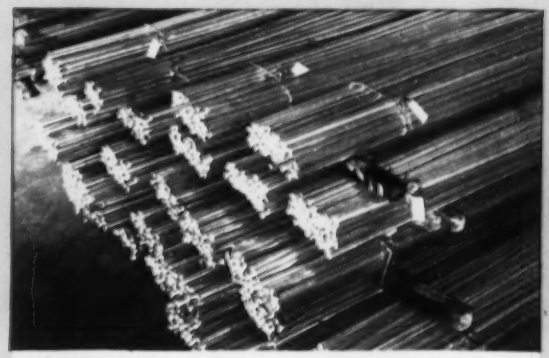
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; tees; zees. Suited to a variety of structural applications.



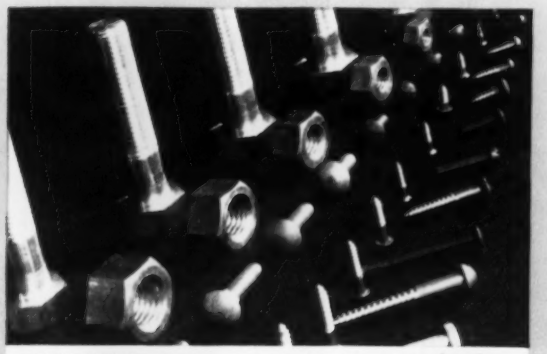
SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK: Square, hexagonal and rectangular bar stock in all commercial alloys. Hot rolled and cold finished to final dimensions for superior tolerance and finish.



SCREW MACHINE STOCK: Available in 11S-T3, the free-cutting alloy and 11S-T4, a higher strength alloy plus 24S, 61S and 75S.

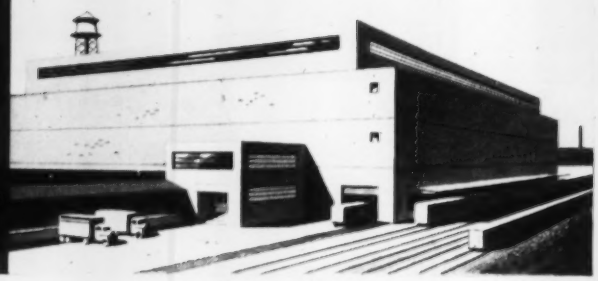


FASTENERS: Machine screws, wood screws; washers; nuts; bolts; rivets. Recommended for fastening aluminum to prevent electrolytic damage.

WELDING AND SOLDERING: Welding and brazing wire; welding and brazing flux; solder flux; solder.

Your Alcoa Distributor has Alcoa Standard Warehouse items in stock

Your Alcoa Distributor is as near as your telephone and his warehouse is stocked with the aluminum products you need for fast, economical production. His facilities include modern equipment for sawing, shearing and slitting stock to your specifications and for making prompt deliveries.



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*Home Office

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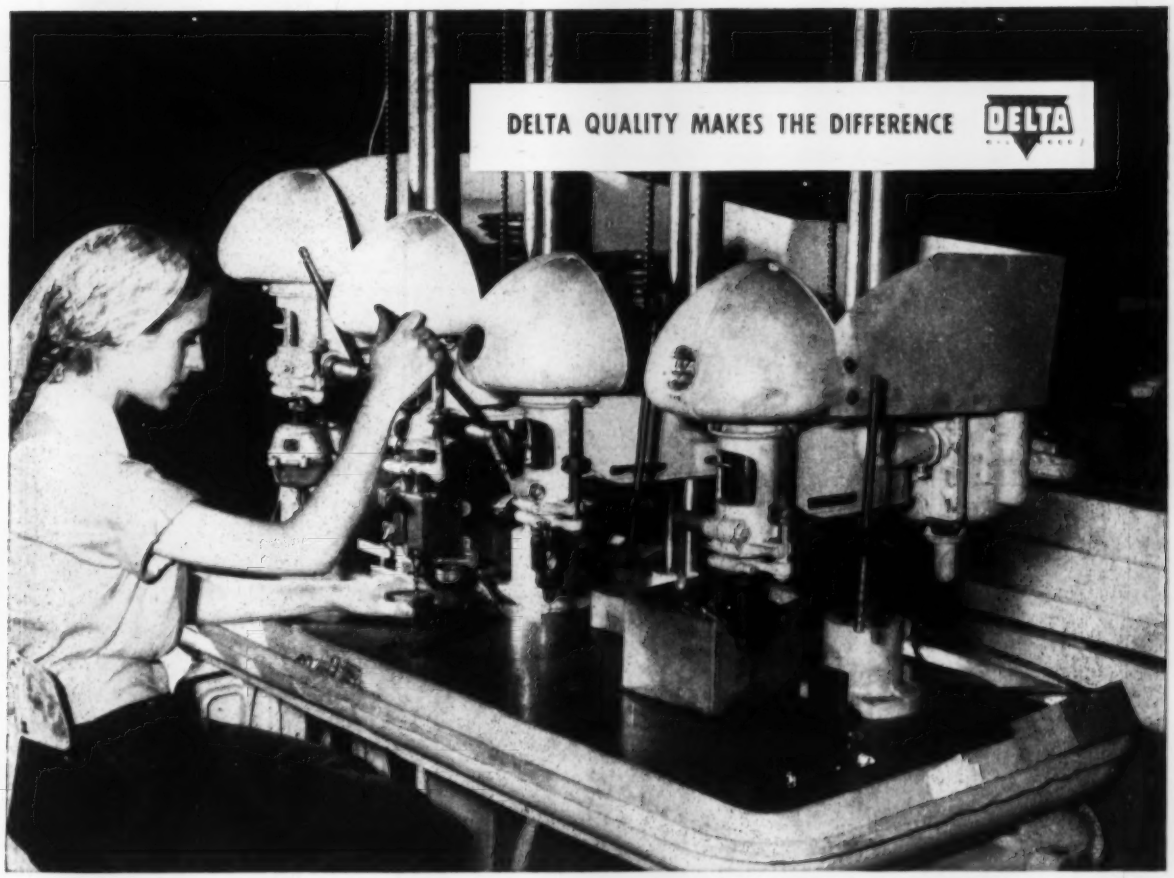


One Operator Plus One **DELTA** Set-Up

HOLLOW MILLS, DRILLS, TAPS AND COUNTERSINKS

AT SKILLMAN HARDWARE

More pieces per hour with less labor cost—that's what Skillman Hardware Manufacturing Co., Trenton, N. J., gets by locating inexpensive Delta tools in groups so that related machining operations can be done by a single operator.

Though Delta tools are inexpensive, they are production machine tools—as accurate as tools costing many times as much.

Here's the testimony of John Strasenburgh, Skillman production foreman: "Of course, since we build locks, our precision standards are very high, and we work as close as .0005", but our Delta tools are accurate, dependable and easy to operate."

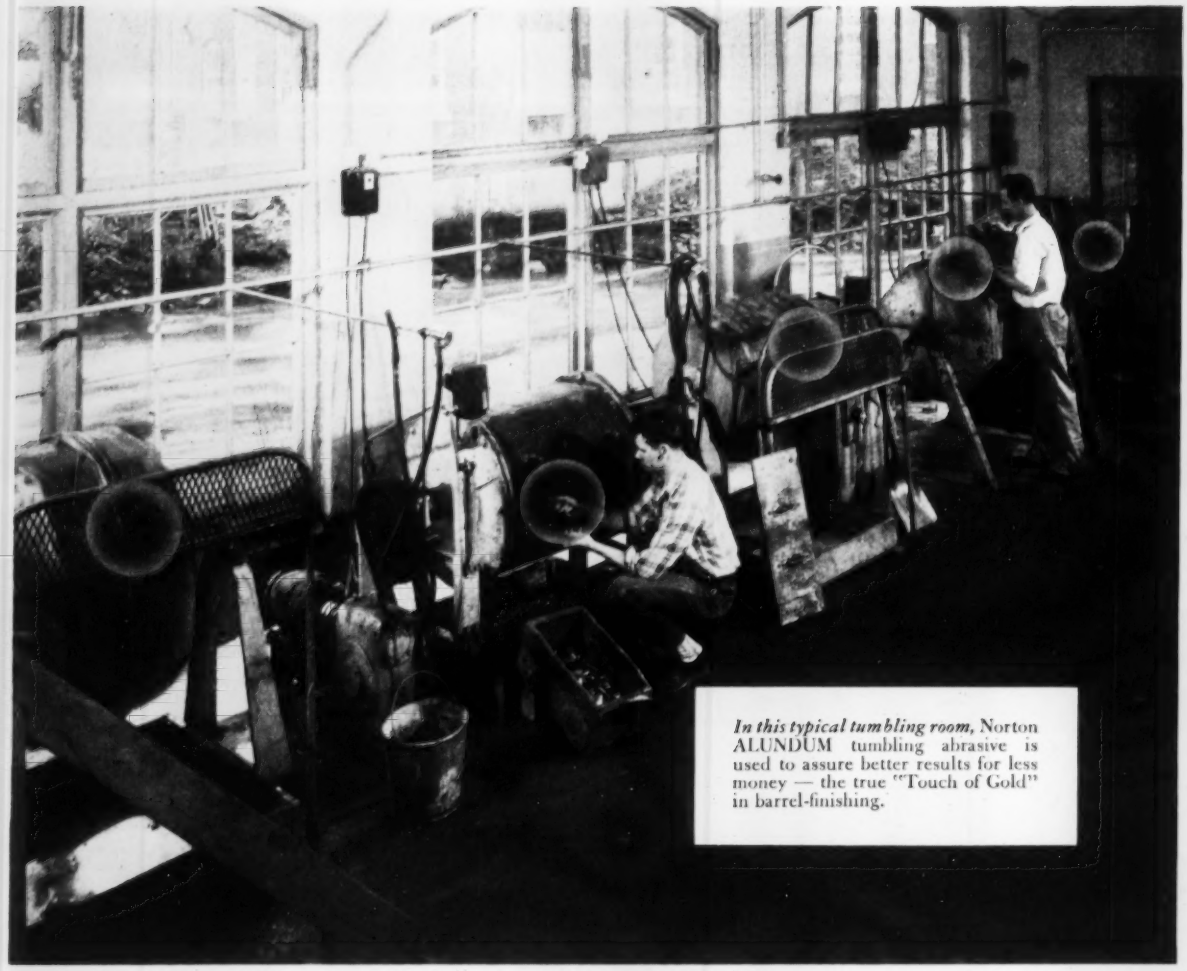
These are some of the ways Skillman groups Delta tools:

- . . . two Delta drill presses side by side; one drills, the other taps.
- . . . three Delta drill presses together to drill, tap and counter sink.
- . . . four Delta drill presses—to hollow mill, drill, tap and counter sink.
- . . . two 17" Delta drill presses mounted on single column with opposing spindles drilling and reaming same hole in one set-up.

Light, mobile, dependable Delta tools are easily adapted to hundreds of production jobs. There's a wealth of such performance data available to you. Ask your Delta dealer—he's in your Classified Phone Book under "Tools," "Machinery" or write for Catalog AB52 to Delta Power Tool Division, Rockwell Manufacturing Co., 638B N. Lexington Ave., Pittsburgh 8, Pa.

DELTA quality power tools

Another Product of Rockwell



In this typical tumbling room, Norton ALUNDUM tumbling abrasive is used to assure better results for less money — the true "Touch of Gold" in barrel-finishing.

Start with ALUNDUM* tumbling abrasive . . . and you'll finish with the

"TOUCH OF GOLD"

Especially developed to eliminate hand finishing of stampings, forgings and castings, Norton ALUNDUM tumbling abrasive is processed to impart a strong, blocky shape to the individual grains, with no sharp projections to mar the work. Here are some of the reasons why barrel-finishing with this tough, hard abrasive is standard in leading plants:

- It provides the fastest, most economical method of finishing metal parts to exact dimensions and surface finishes.
- It removes burrs, flash, tool marks and heat scale from large quantities of parts, saving endless man-hours.
- It eliminates many slow hand-finishing operations, increases production rate of parts ranging in size from tiny needles to hefty castings.

Learn how ALUNDUM tumbling abrasive can bring *you* the value-adding, cost-cutting "Touch of Gold" — by giving you constantly better finishing results while helping you shorten tumbling cycles, reduce scrap and reworking. Whether or not you have barrel-finishing, Norton will gladly make test runs for you, to show you what this process with ALUNDUM tumbling abrasive will do for you.

See your Norton Distributor, and ask him for the new edition of the 55-page booklet on barrel-finishing. Or write to NORTON COMPANY, Worcester 6, Mass.

Distributors in all principal cities, listed under "Grinding Wheels" in your classified phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

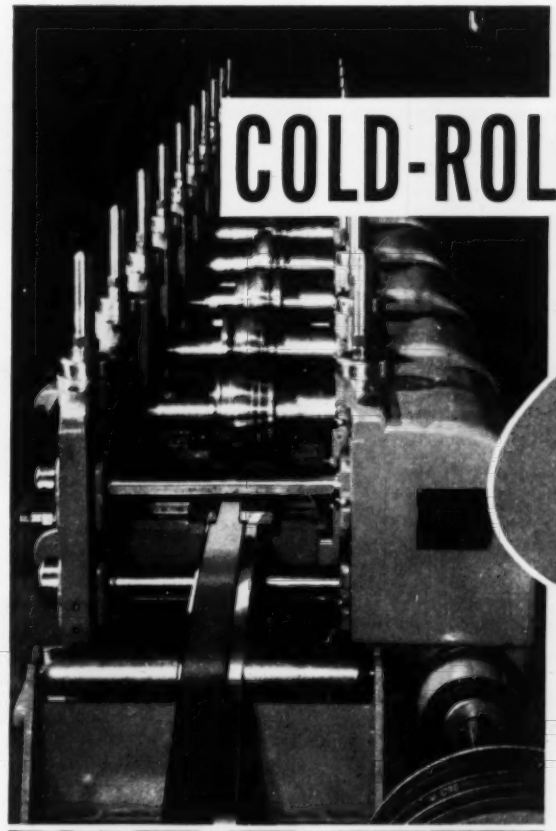
G-265

NORTON

ABRASIVES

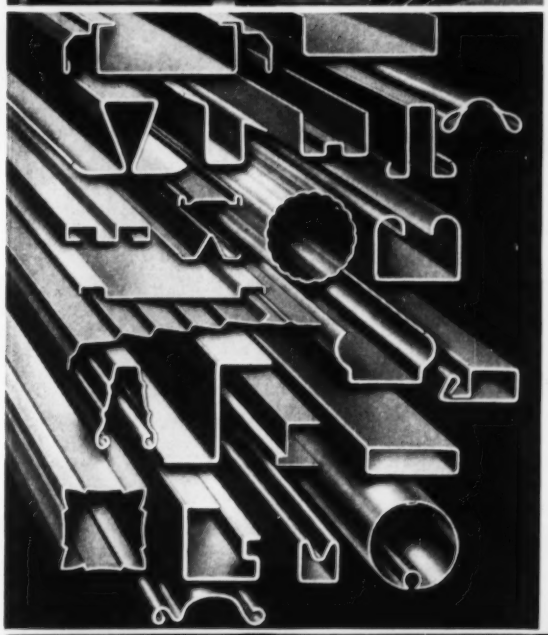
Making better products . . . to make other products better

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



COLD-ROLL FORMING...

a CHALLENGE and a PROMISE



Cold Roll Forming holds a perpetual challenge to your skill and ingenuity in devising new ways to step up production and reduce cost. Infinite possibilities are suggested by thousands of existing applications in the high-production metal working industries.

New applications are constantly being discovered. Total production of Yoder cold roll forming machines now runs into billions of feet annually.

A Yoder roll forming machine can be arranged for doing other operations, such as notching, embossing, perforating, curving, coiling, welding, etc., at little or no extra labor cost. Yoder engineers are at your service in designing such multi-purpose production lines.

The Yoder Book on Cold Roll Forming discusses its varied functions and advantages, with scores of photos illustrating end uses of roll formed products. Ask for it.

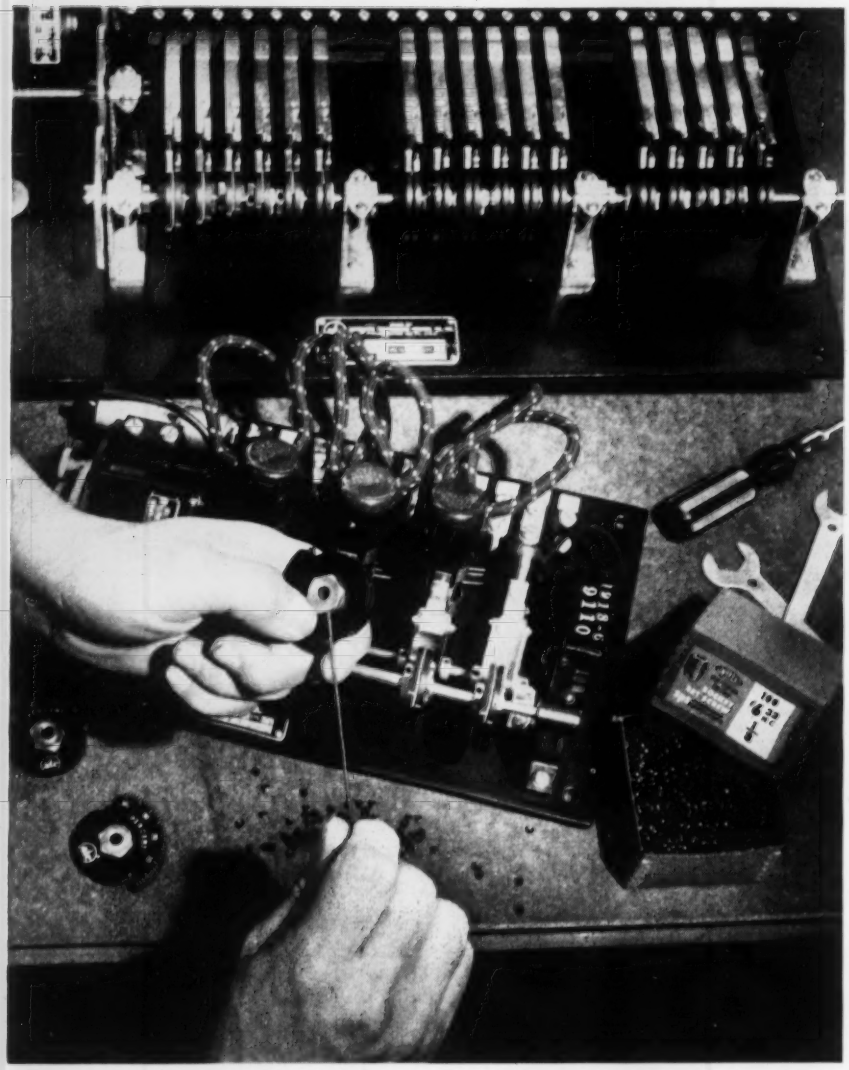
THE YODER COMPANY

5502 Walworth Ave. • Cleveland 2, Ohio

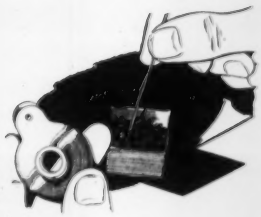
Complete Production Lines

- ★ **COLD-ROLL-FORMING** and auxiliary machinery
- ★ **GANG SLITTING LINES** for Coils and Sheets
- ★ **PIPE and TUBE MILLS**–cold forming and welding

ENGINEERING YODER MANUFACTURING



Two UNBRAKO Self-Locking Socket Set Screws are used on each cam of these precision multicircuit cam timers. The screws position the cams so as to control accurately the sequence and duration of one or a series of individually timed machine or process operations.



Assembler picks up tiny UNBRAKO set screw with long arm key preparatory to threading it into cam assembly.

He inserts the UNBRAKO, and turns it into the assembly; then after positioning cam, tightens it. The accurate depth and size of the hex socket result in maximum torquing—the knurled cup point holds the cam accurately in place.

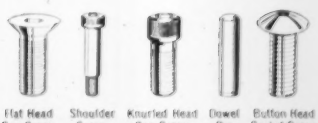
UNBRAKOs—made of heat treated alloy steel—have fully formed threads, Class 3 fit, are supplied in standard sizes from #4 to 1".

You'll need less space for storage when you use UNBRAKO Standards—stocked by your distributor

You'll need less space for storage and be able to carry a smaller inventory, because standard UNBRAKO socket screw products are in stock at your local industrial distributor's. And you'll save time and money, because deliveries are prompt. For more information, write for UNBRAKO Standards—a complete listing of socket screw products made by the world's largest manufacturer of these precision fasteners. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

SPS JENKINTOWN PENNSYLVANIA



Flat Head Cap Screw | Shoulder Screw | Knurled Head Cap Screw | Dowel Pin | Button Head Socket Screw

any way you look at it . . .

portable grinding is profitable grinding with SIMONDS resinoid bonded grinding wheels

Spot grinding! Smoothing welds! Grinding in corners! Working with odd shapes! Wherever low-cost, top-speeding efficiency is essential, Simonds portable wheels do the job. They cut fast, hold their shapes, give long service, and include everything you need—straight wheels, cup wheels, saucer pot-balls and blind-end wheels. Resinoid bonded for high speeds up to 9500 s.f.p.m. Write for free folder ECA-42.

Rotor type cup wheel—cross section shows steel bushing flange and safety ring.

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PHILADELPHIA 37, PA.

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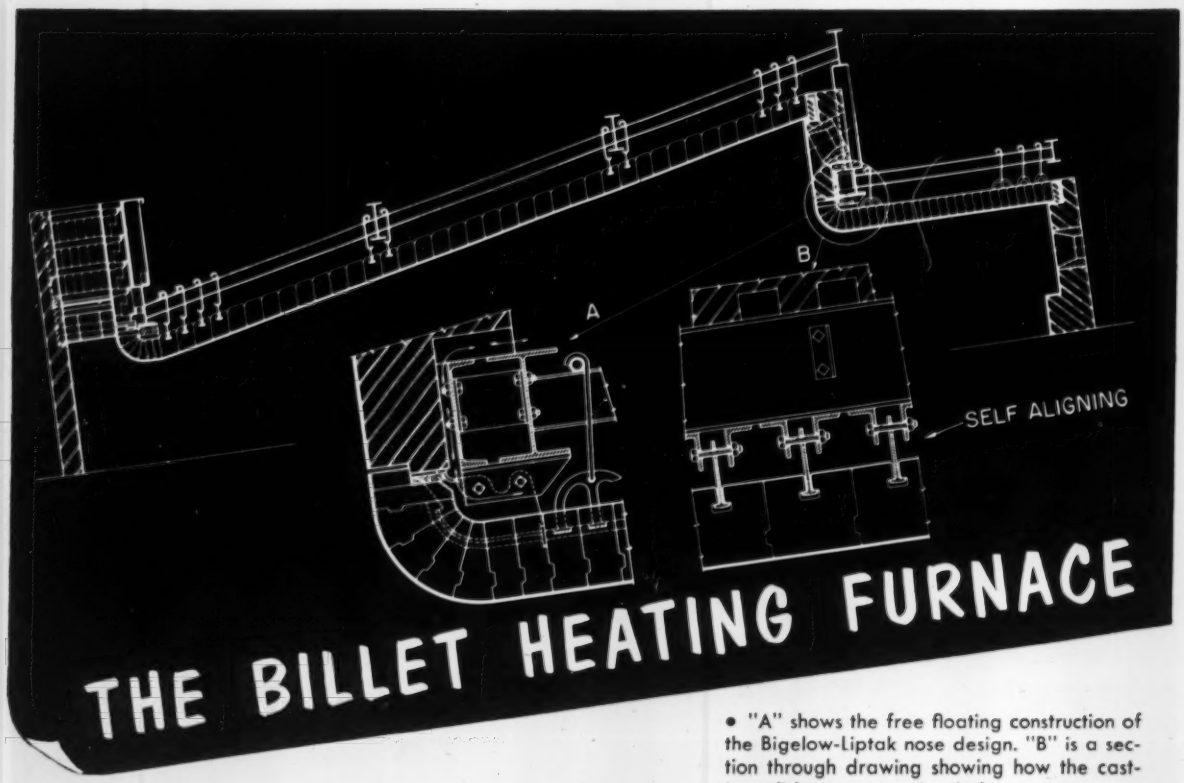

THE BILLET HEATING FURNACE

• "A" shows the free floating construction of the Bigelow-Liptak nose design. "B" is a section through drawing showing how the castings slide on supporting bolts.

THAT LEADS WITH ITS NOSE...

THE PROBLEM . . .

A new radial nose tile for billet heating furnaces. Previously, cumulative expansions of rigidly hung nose tile in wide metallurgical furnaces had caused mechanical failures of tile and castings . . . plus "shut down" losses of production time.

THE ANSWER . . .

A *free floating* nose designed by Bigelow-Liptak engineers to control expansion movements at this highly vulnerable point. The free floating feature is only possible with unit-suspension construction . . . another Bigelow-Liptak development.

THE RESULT . . .

Steady, everyday, on-the-line effectiveness.

Write today for more information on industrial furnace enclosures.

BIGELOW-LIPTAK *Corporation*

and Bigelow-Liptak Export Corporation

2550 W. GRAND BLVD. • DETROIT 8, MICHIGAN

UNIT-SUSPENDED WALLS AND ARCHES

In Canada: Bigelow-Liptak of Canada, Ltd., *Toronto, Ontario*

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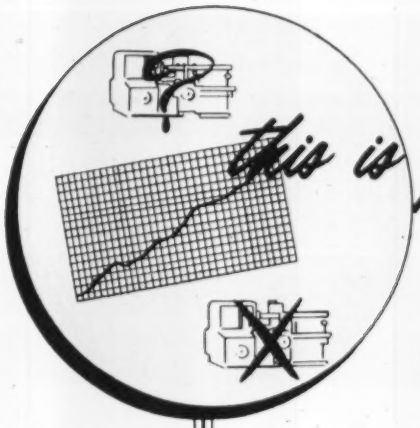
PITTSBURGH • PORTLAND, ORE. • ST. LOUIS • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SAULT STE. MARIE, MICH. • SEATTLE • TULSA • VANCOUVER, B.C.



this is your problem in 1954!

Industry is now planning the rejuvenation of its manufacturing processes and equipment for the competitive era ahead.*

It's a time-consuming job.

How can it be *speeded up* for *you?*

**see the 1953 ASTE Obsolescence Report.*

what ASTE is doing to help you

The American Society of Tool Engineers is assembling in Philadelphia's Convention Center on April 26 to 30 inclusive the latest in production equipment and processes available from over 450 manufacturers. The exhibits will be open to you and your key men during these five days, from 9:00 A.M. to 5:00 P.M. Included will be inspection and automation devices, machine tools, accessories, cutting tools, and allied equipment.

Simultaneously, a series of top-level Conferences will be held dealing with such major industrial problems as Plant Management, Automation, Precision Control, Metal Forming, and Assembly Methods.

it's up to your key men NOW!

. . . whether your company moves forward or falls behind in the competitive era ahead. To help you select the key men in your organization who definitely should visit the Exposition, the ASTE has prepared a "plan booklet" which covers every aspect of the ASTE Exposition and Conferences. Write today for a copy on your company letterhead. It will be mailed to you promptly, free of charge.

Available on request to all industrial executives.

This advertisement is sponsored by the 27,600 Members of

THE AMERICAN SOCIETY OF TOOL ENGINEERS

10700 Puritan Avenue — Detroit 38, Michigan

A guide for selecting temperature control for top furnace performance

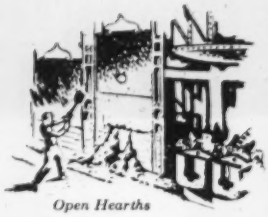
Today, industry's need for lower operating costs ... reduced maintenance ... high quality of production ... has spot-lighted the importance of "tight" furnace control.

With closer specifications and higher control standards, more and more plants must pin down troublesome, costly departures from favorable heat-treating conditions.

To meet this demand, Leeds and Northrup has a complete line of matched temperature control systems available. You get equipment matched to your particular requirements. Each system comes to you as a "package" ready to handle the individual conditions created by your product, your production and your furnace.

There's an L&N control to match every industrial furnace

Annealing Furnaces



Open Hearths

TWO-POSITION CONTROL

For fuel-fired or electric furnaces

What it does:

Cuts heat input back to "low" when temperature exceeds control point . . . turns heat input on full when it falls below control point.

When to use it:

1. When changes in heat supply or changes in load are promptly "felt" by the temperature detector.

2. When alternate undershoot and overshoot will not damage product or process equipment, or slow down production.

3. When furnace pressure or fuel-air ratio *are not* controlled and the products of combustion *do not* form a protective atmosphere for the work.

PROPORTIONING-TYPE CONTROL

For fuel-fired furnaces

What it does:

Adjusts heat input by varying valve opening according to size of temperature change.

When to use it:

1. When there's a substantial time lag, before changes in heat supply or changes in load are "felt" by the temperature detector.

2. When load changes on continuous processes are both small and infrequent, and control point is rarely changed.

3. On batch process where operation is usually at the same temperature, and rapid recovery from upsets after loading is not important.

4. When furnace-pressure or fuel-air ratio *are* controlled, or the products of combustion *do* form a protective atmosphere for the work.

POSITION-ADJUSTING-TYPE CONTROL (P.A.T.)

For fuel-fired furnaces

What it does:

Adjusts heat input by varying valve opening according to size, duration and speed of temperature changes.

When to use it:

1. When there's a substantial time lag, before changes in heat supply or changes in load are "felt" by the temperature detector.

2. When load changes are both large and frequent and control point must be changed to suit various conditions.

3. When furnace design requires a continuously throttled flame.

4. When furnace-pressure or fuel-air ratio *are* controlled, or the products of combustion *do* form a protective atmosphere for the work.

5. Whenever overshoot is costly, hazardous or can cause damage to the product or heating equipment.

DURATION-ADJUSTING-TYPE CONTROL (D.A.T.)

For fuel-fired or electric furnaces

What it does:

Adjusts heat input by varying length of "heat on" time according to size, duration and speed of temperature changes.

When to use it:

1. When there's a substantial time lag, before changes in heat supply or changes in load are "felt" by the temperature detector.

2. When load changes are both large and frequent, and control point must be changed to suit various conditions.

3. When furnace design requires use of "on-off" operation of heat supply.

4. When furnace-pressure or fuel-air ratio *are not* controlled, and the products of combustion *do not* form a protective atmosphere for the work.

5. Whenever overshoot is costly, hazardous or can cause damage to the product or heating equipment.

***For complete information** regarding L & N Matched Temperature Control, write 4957 Stenton Ave., Phila. 44, Pa., or contact our nearest office.*

LEEDS NORTHRUP

instruments *automatic controls • furnaces*

Jrl Ad N 33(58c)

Nothing finer!

A statement from
a conservative organization:

"Our records show that when a manufacturer once discovers the uniform quality of Roebling flat spring steel, he becomes a steady Roebling customer."

You, too, *pay* for the best spring steel... make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

S.S. United States... most modern, fastest liner afloat.

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use the oil that gives GREATER PROTECTION

HIGH PRESSURE, high temperature and water — those are the reasons why your back-up rolls must have effective oil film lubrication — *Texaco Regal Oil*.

Texaco Regal Oil is a turbine-quality heavy circulating oil especially developed for continuous rolling operations. It has outstanding stability and resistance to oxidation, emulsification and sludging — separates rapidly from water. *Texaco Regal Oil* thus keeps oil lines and bearings clean — assures trouble-free performance, longer bearing life and lower maintenance costs.

For enclosed reduction gears, *Texaco Meropa Lubricant* should be used. It retains its EP properties in severest service and has high resistance to oxidation, thickening and foaming.

Let a Texaco Lubrication Engineer help you improve performance and cut costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

TUNE IN . . . METROPOLITAN OPERA radio broadcasts every Saturday afternoon. See newspaper for time and station.

Metalworking Outlook

Look Out for March

March is the crucial month for the economy this year. According to predictions, employment should rise slightly, production should improve and consumers should increase their spending for hard goods in the period. President Eisenhower says he'll consider remedial action in case all this doesn't happen. One step he would take would be to recommend raising personal income tax exemptions. The controversy still rages as to what actual unemployment now is. The Commerce department earlier put the January jobless figure at 2.4 million, then last week set it at 3.1 million on the basis of a different sampling. Take your pick.

Silver Lining?

The threat of layoff is unpleasant, but it can have one good effect: Efficiency often improves. Checks indicate efficiency now is as much as 10 per cent better in some plants. Personnel men, however, point out that wholesale or poorly handled layoffs can wreck employee morale and result in lower efficiency of the workers remaining. For tips on how to minimize the distress of layoffs, see p. 62.

On the Front Line for GAW

General Electric Co. and Westinghouse Electric Corp. may be the first two major companies from which labor tries to secure the guaranteed annual wage this year. Both open wage talks this spring. The CIO electrical workers have already gone on record as seeking GAW, and the independent United Electricalworkers will probably demand the same thing for competitive reasons.

In Good Shape

Small Business Administrator Wendell Barnes told the Senate Small Business Committee that small business is in a readjustment period which will taper off when new military orders are placed later this year. He sees no reason to be alarmed, even though small companies are now feeling the arms cut along with a moderate civilian business decline. Although small business failures increased in the last three months of 1953, they were still well under the 50-year average. Nevertheless, Mr. Barnes predicts that the U. S. may soon be lending $5 million a month to little firms.

Aluminum Gains

Watch for primary production of aluminum this year to approach 1.5 million tons. That's 250,000 tons more than last year and nearly ten times U.S. production in 1939. Aluminum Co. of America estimates that by 1975 U.S. consumption of primary aluminum might be about 3.6 million tons and the rest of the free world's use may reach 2.4 million tons.

Less Ore in 1954?

Great Lakes ore vessels are being readied for anotner ore-carrying season, to start in late March or early April. The record 94.9 million gross tons

brought down the lakes in 1953 probably will not be surpassed in 1954. Also, the peak output of 119.2 million tons produced by all U.S. mines last year probably will stand. But ore imports are scheduled to rise sharply this year over the 10.5 million tons brought from foreign sources in 1953. By the close of the year, foreign mines will be capable of supplying more than 20 million tons annually. Imports in 1955 may approach that figure.

Uncle Sam: Businessman

Look for more moves by Washington this year to get out of businesses that compete with private enterprise. The House Subcommittee on Intergovernmental Relations, chairmanned by Rep. C. M. Harden (Rep., Ind.), lists more than 100 commercial activities in which government is currently engaged and calls for remedial action. While barge lines, rubber plants and RFC loans have been or will be sold, don't expect the U.S. to get out of the really giant projects, such as the Tennessee Valley Authority. National Associated Businessmen, Washington, claims that sale of federal commercial enterprises would reduce the national debt by $25 billion to $30 billion, slash interest payments by more than $500 million a year and boost income tax receipts by $1 billion to $2 billion a year.

Preclearance from FTC

Are you worried about the Federal Trade Commission's reaction to a proposed merger or company acquisition? You may be able to set your mind at rest by asking FTC what it thinks before you make a move. While the commission has not yet set up its proposed Bureau of Consultation, the consultative function has been increasingly exercised of late. The FTC's Bureau of Antimonopoly handles inquiries on mergers and acquisitions.

Straws in the Wind

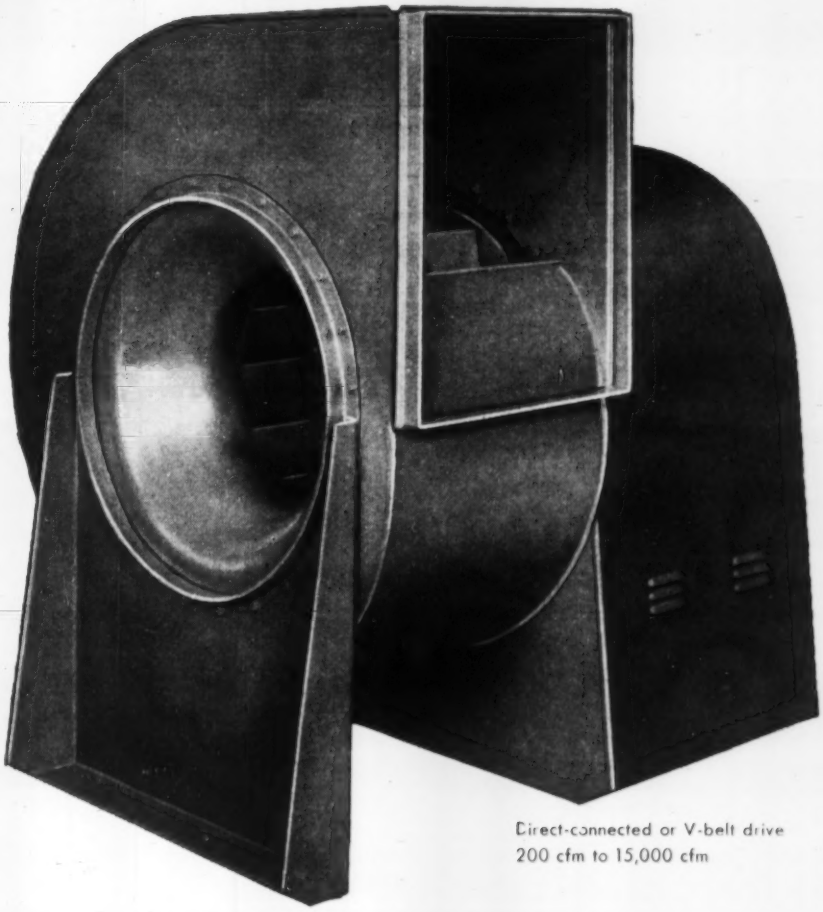
National Radiator Co. is expanding its powdered metal division in Johnstown, Pa. . . . Los Angeles, with eight major assembly plants, now ranks second to Detroit in auto production . . . H.R. 7709 would extend the suspension of import taxes on copper for two years beyond the present June 30, 1954, expiration date . . . R. J. Wysor, U.S. Steel Corp. consultant, on Mar. 1 becomes chief of a new iron and steel section in the Office of Defense Mobilization.

This Week in Metalworking

The House Ways & Means Committee early in March will have ready its tax proposals, the first general revision of our internal revenue law since the 1870s (p. 51) . . . Housing construction will get a strong shot in the arm if the President's proposals on the matter are adopted (p. 52) . . . Industry should back more liberal state unemployment compensation programs as an alternate for the guaranteed annual wage (p. 53) . . . First there was a move for piggyback trucks on railroad flat cars; now there's a move for truck-carrying ships in coastal traffic (p. 54) . . . Rare earths are becoming more important in steel technology (p. 56).

NEW!

ALL-PURPOSE VENTILATING SETS YOU CAN PUT INTO SERVICE FAST!



Direct-connected or V-belt drive
200 cfm to 15,000 cfm

Here's a new line of Westinghouse motor-driven ventilating sets. They are ideal for general purpose ventilation, for exhaust, for processes, and for removal of heat, fumes and vapor.

Where changing plant or building conditions create an unexpected need for ventilation, these sets are a quick solution. Here's why:

COMPACT SIZES—down to 10" x 12" x 16"—take little space, are easy to install.

SINGLE UNIT—fan, motor and drive all made and assembled by Westinghouse.

DIRECTION OF DISCHARGE—can be changed on the job.

LOW MAINTENANCE permits use of out-of-the-way locations.

WEATHERPROOF COVERS permit outside installation.

SHORT DELIVERIES get your job started sooner.

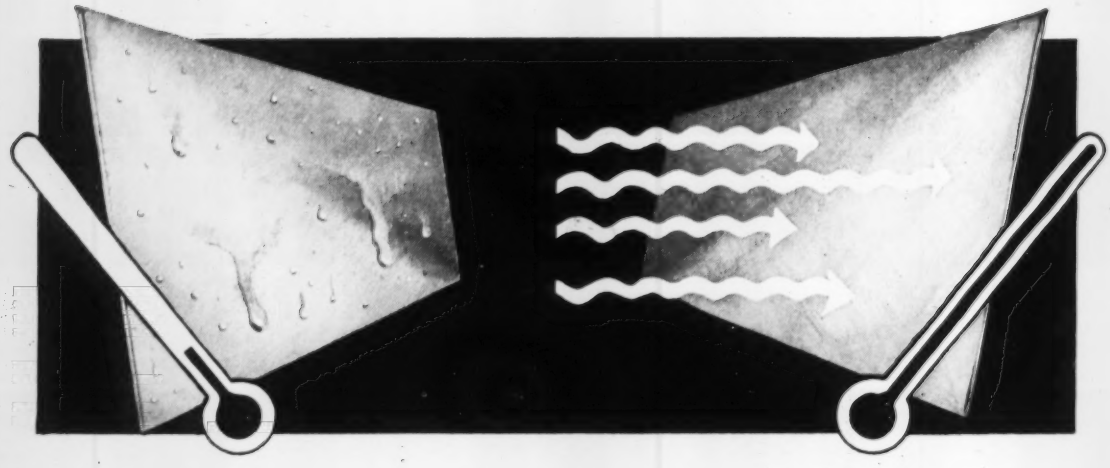
These ventilating sets are low in first cost, low in operating cost. You get a single warranty because fan and motor are both built by Westinghouse.

For other exclusive features and full information, ask for Catalog 1160. Call your local Westinghouse-Sturtevant office. Or, write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park 36, Massachusetts.

WESTINGHOUSE AIR HANDLING

J-80317

YOU CAN BE SURE ... IF IT'S Westinghouse



RESISTS HEAT BETTER THAN ANY METAL IN ITS PRICE CLASS!

Better than any metal in or near its price for cyclic high temperature heating and cooling service! That's what independent tests show for Armco ALUMINIZED Steel, sheet steel coated in a bath of molten aluminum by a patented process.

ENDURANCE AT HIGH TEMPERATURES

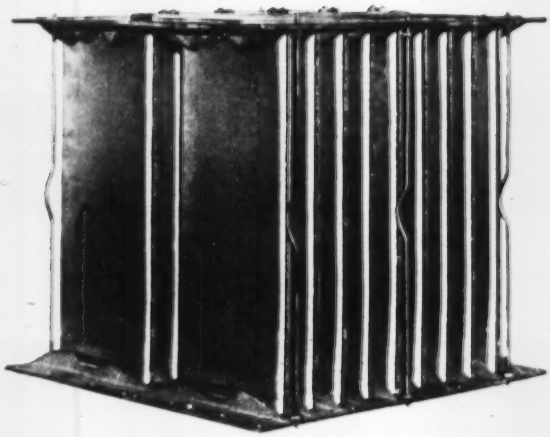
In these tests, Armco ALUMINIZED Steel was exposed to burning sulfur-bearing gases at temperatures up to 1325 degrees F. Results showed lower maximum and average rates of penetration in mils per year than any other metal near its cost.

RESISTS PRODUCTS OF COMBUSTION

When heated to as high as 825 degrees F, then cooled to 80 F in cyclic tests, Armco ALUMINIZED Steel showed many times the resistance of any competitively priced metal—to heat, and to the mixture of the products of combustion of sulfur-bearing gases and the condensate that forms on cooling.

PROVED IN SERVICE

These tests explain the many years of successful service obtained from Armco ALUMINIZED Steel in combustion chambers and heat exchangers. Besides being used for heat- and corrosion-resistance, this Armco Special-Purpose Steel is widely used for heat reflection. For further information on Armco ALUMINIZED Steel, just fill out the coupon and mail it to us.



The core of a gas-burning industrial heater—the heat-exchanger tube assembly. The tubes are made of Armco ALUMINIZED Steel for resistance to oxidation at elevated temperatures, and to the condensate that forms on cooling.

ARMCO STEEL CORPORATION
2244 Curtis Street
Middletown, Ohio

Send me information on Armco ALUMINIZED Steel for

- ☐ Heat- and Corrosion-Resistance
- ☐ Heat Reflectivity

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ARMCO

Eight Changes

Students of the American economic system are becoming aware of the fact that marked changes in the make-up of our population and in the manner of its living are creating forces that will have a profound effect upon the nation's future development. Many economists have commented on these changes, but it has remained for Arno H. Johnson of J. Walter Thompson Co. to link some of them together in what he calls "seven powerful . . . . internal pressures for expansion."

The first change on his list is the discretionary spending power of the American people. Today it is five times as great as in 1940. The second is the change in the age-mix of our population. Right now there are 65 per cent more children under five years than in 1940. Third is the change in the education level; there are 80 per cent more high school graduates in our adult population than in 1940. The fourth change is in the age of buildings; 50 per cent are over 30 years old.

Fifth, but extremely important, is the sharp change in the number of motor vehicles. Today there are 72 per cent more cars than in 1940 and facilities for handling them are woefully inadequate. The sixth change is the drop of 7.5 million persons in our farm population since 1940. Seventh and last in Mr. Johnson's list is the population shift to the suburbs which has caused spectacular gains in population in the outer fringe of most large cities.

Almost everybody will agree that these seven changes provide strong support for a healthy, expanding national economy. However, it is possible that an eighth change—one of equal or greater importance—has been overlooked. It is the spectacular advance in research and technology since the end of World War II—an advance which Clyde E. Williams, president, Battelle Memorial Institute, declares is proceeding at almost an explosive tempo and may be characterized as the "technological revolution." This revolution, he says, will supply man's insatiable wants with newer and better things at lesser cost.

Ponder these eight changes and feel more confident about the future!

E. L. Shaner

EDITOR-IN-CHIEF

EMPHASIS ON SELLING: This publication's editors present in this issue the first of ten articles that will constitute their "Program for Management in 1954." It is highly significant that the first of the ten (pp. 91-98) is entitled "Now You Have To Sell." From just before Pearl Harbor (Dec. 7, 1941) until a few months ago we were in a period when the buyer

was at the mercy of the supplier. During most of this period, persons in the metalworking industry who normally would have been engaged in selling, in most cases were expediting shipments, placating customers and doing almost anything except selling.

Now that a buyers' market has returned, the pressure of competition is going to force practically every company to put forth a superb sales effort. Some companies will meet this challenge successfully, but unfortunately others will not. During the next two or three years Dun & Bradstreet's compilation of so-called "business failures" will include the names of scores of concerns whose officers had forgotten that real salesmanship is a "must" for success in competitive business.

* * *

WHERE ARE SALESMEN? In their efforts to stir up new enthusiasm for effective selling, some sales managers are harping strongly on the fact that in some lines today's salesmen are not going in for individual solicitations to the extent their predecessors did several decades ago. Probably the experience of many readers will indicate that the sales managers have a good point.

For instance, if you will check among a number of your acquaintances, you probably will find that many of them have not been solicited directly by an automobile salesman in many years. The same usually holds true for electric refrigerators and some other major appliances. When a man starts raising a family he may be visited by salesmen, but after the first car, refrigerator, etc., he usually buys on his own initiative, rather than as a result of effort on the part of a salesman.

* * *

A POSITIVE APPROACH: Many of the representatives of industry who attended the American Management Association's Personnel Conference in Chicago last week came away with a clearer understanding of the connection between state unemployment compensation programs and the so-called guaranteed annual wage which the unions have been demanding for a number of years.

As a matter of fact, Sumner H. Slichter, Harvard University economist, recommended that industry should back more liberal state unemployment compensation programs as an alternate for the guaranteed annual wage. This idea, which seems to be gaining favor among industrial relations executives (p. 53), would have the merit of providing employers with a more positive approach to bargaining on the guaranteed annual wage.

In any event, the discussions will lead inevitably to greater concern for stability in production and employment. They also will lead to studies of how state unemployment compensation can be amended to provide better benefits.

* * *

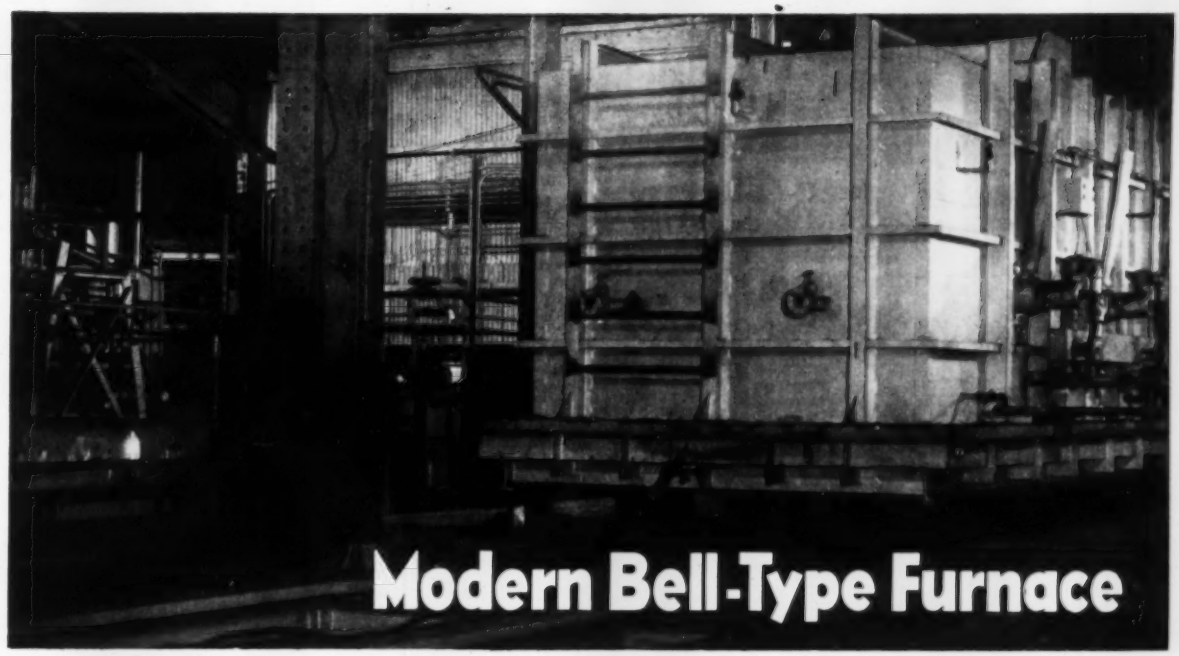
FOR TRAFFIC SAFETY: Last Wednesday, Thursday and Friday several thousand representatives from all of the 48 states met in Washington at the invitation of President Eisenhower to see if something can be done to reduce the terrific annual traffic toll. The delegates were told that more lives are lost in traffic accidents than in the wars in which this nation becomes involved. One authority declared that traffic accidents and congestion cost the nation $7 billion a year.

President Eisenhower told the delegates that "in a democracy public opinion is everything" and therefore that if we can mobilize a sufficient volume of public opinion to demand effective action on traffic safety, then "this problem, like all others, can be solved."

American industry has a big stake in this problem of traffic safety. Far too many accidents are suffered by employees going to or from work, and the pity is that most of these accidents are wholly unnecessary. Industry should lend full support to whatever safety program comes out of the President's traffic safety conference.

* * *

CLEARS BIG BRIDGE JOB: Last Wednesday the Mackinac Bridge Authority received a check for $96,400,033.33, which represents the proceeds from the sale last December of $99,800,000 of tax-exempt revenue bonds which were authorized to provide funds for the construction of a five-mile toll bridge over the Straits of Mackinac in Michigan. Receipt of the money clears the way for starting work on the subconstruction, for which Merritt-Chapman & Scott Corp. holds a $26-million contract. American Bridge Division of United States Steel Corp. has a contract for $44,500,000 for fabrication and erection of the superstructure. This is the largest bridge job since the San Francisco Bay project.



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At left: Furnace bell being lifted from load of annealed bars. Above: Bell in annealing position on loaded car.

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RYERSON

The Major Proposed Tax Changes That Will Affect Business

- ☑ Provision for deduction of research and development expenditures as an expense.
- ☑ More liberal depreciation allowances.
- ☑ Liberalization of the penalty tax treatment of corporaations.
- ☑ Simplification and liberalization of taxation on partnerships.
- ☑ Simplification and liberalization of tax treatment of corporate reorganizations and recapitalizations.
- ☑ Extension of loss carryback from one to two years but continuation of loss carryforward at five years.
- ☑ Provision for deduction as an expense the accumulation of reserves for known future expenses.
- ☑ Lower tax (14 per cent below tax on domestic earnings) on corporate income from foreign sources.
- ☑ Simplification and liberalization of rules governing establishment of pensions and profit-sharing plans.
- ☑ Liberalization of tax treatment of dividends.

First Major Overhaul in 80 Years

The 1954 tax bill, to be ready in March, will revise the tax structure to meet today's needs. It's the result of the first full-scale U. S. study since the 1870s

THIS IS THE YEAR Congress will modernize a buggy-whip tax system so that it will be more suitable for a jetomic age.

The House Ways & Means Committee hopes to have its revisions to the internal revenue law ready by early March. For the first time since the 1870s, it has reviewed all in one piece the law under which Uncle Sam collects tax revenue.

Closed Rule—The 1954 internal revenue bill will be presented to the House with a closed rule prohibiting amendments without the committee's approval. That means that the House will pass a bill containing the provisions which have been hammered out since Jan. 13 in daily Ways & Means Committee meetings. As of late last week, the ten major revisions affecting business (listed above) had either already been formally approved by the committee or were believed to have good chance of approval.

Still up in the air were decisions on what to do about revamping the nation's excise system and whether to allow the drop in corporate tax rates from 52 to 47 per cent to go into effect Apr. 1, as scheduled. Those two matters may be dealt with in a separate, companion measure.

Trouble Spot—If the House revision bill strikes snags, they will develop as usual on the Senate side;

if the Senate insists on changes, June may be upon us before a final bill is in shape that's acceptable to both the House and Senate. That possible timetable is the reason why the corporate tax and excise matters may go into a separate bill. Both those problems must be decided upon by Apr. 1.

Vital—Many industrialists think that liberalized depreciation is the most important of the ten major revisions. Ways & Means has already agreed to provide for: Binding agreements on depreciation rates that can be made between the taxpayer and Treasury; a choice for the taxpayer among different methods of computing depreciation; and the use of the taxpayer's preference in rates where they differ by less than 10 per cent from the Treasury's.

The important point is the choice to be permitted in picking different methods of figuring depreciation. For example, a declining balance method will be allowed at a yearly rate that's double the straight-line rate. In that way, the old life-expectancy rates will continue, but the taxpayer will take his tax deduction at twice the straight-line percentage, then apply this percentage each year to the undepreciated balance. Thus, the write-off would be high in early years—about two-thirds of the cost would be written off during the first half of the item's life.

Closing a Loophole—Not all of the tax changes, however, will make the laws more lenient. For example, Ways & Means has approved a provision that will make it more difficult for a company to get a tax benefit by acquiring a firm that has had a loss.

Under the committee provision a a corporation can shift from an unsuccessful to another line of business without any limitation on its net operating loss carryover. But if there is a 50 per cent or more change of ownership within two taxable years, then the net operating loss carryover is reduced by the percentage of the change.

But all in all, nongovernment tax experts think the revisions will, in the words of President Eisenhower, help "encourage the initiative and investment which stimulate production and productivity and create bigger payrolls and better jobs."

NEA

Proposed housing bill eases home loans and would provide a . . .

New Lease for Home Building Industry

The administration's proposed housing bill aims at promoting home building through a new low-cost, long-term loan program. Here are the highlights

HOME BUILDERS and the building supply industry eye favorably the administration housing bill. They feel it would stimulate home building through lower down payments, longer maturities and favorable interest rates on loans and mortgages.

Here are the highlights of that proposed bill.

Interest rates on Federal Housing Administration and Veterans Administration loans would be flexible. The President would be authorized to set them within a ceiling of 2½ per cent above average market yields on federal bonds of 15 or more years maturity. He also would have authority to set maximum maturities and minimum down payments on FHA and VA loans and maximum dollar limitations on FHA mortgages.

Up the Ante—Maximum ratio of loan to value could not exceed 95 per cent of the first $8000 and 75 per cent in excess of $8000. Minimum down payments could be $400 on an $8000 house, $900 on a $10,000 house, $1400 on a $12,000 house, $2150 on a $15,000 house, and $3400 on a $20,000 house. Maximum repayment periods on all loans could be increased by the President up to 30 years. The FHA insurance authorization would be increased by $1.5 billion, plus a possible $500 million more on the President's approval.

The bill would authorize FHA insurance of new or existing family dwellings in designated urban renewal areas where the Housing & Home Finance Agency has approved community redevelopment programs. Military housing would be extended to July 1, 1955, and Defense housing would end July 1, 1954.

New Look for FNMA—The Federal National Mortgage Association would be rechartered as a part of the HHFA. New FNMA could buy FHA and VA mortgages and participations of not more than $12,500 per family unit. At the request of the President, in order to "support special housing programs" or "retard a serious market decline," FNMA would make advance commitments and mortgage purchases. In slum clearance and redevelopment the two-third to one-third formula for federal grants to local communities would remain, but the gross cost under the new bill could

include costs of planning for voluntary repair and renewal, clearance of deteriorated structures and other improvements.

Available for matching grants for municipal, regional and small city planning would be $5 million; for noninterest loans for local and state public works, repayable on completion of construction, $10 million would be provided. The purpose is to have plans "ready for construction if the economic situation should require it."

The bill does not provide for public housing because that is authorized by legislation on the books. President Eisenhower has recommended 35,000 low-rent public housing units a year for four years while the new low-cost, long-term, duly-insured loan program is being tested. The present level of public housing is 20,000 units a year.

Nonfarm housing starts declined 3 per cent from December to 66,000 units in January, says the Bureau of Labor Statistics. Of that total, 1300 were public housing starts.

Steel Payroll Hits New High

Estimated total payroll of the iron and steel industry reached a new high level of over $3.35 billion in 1953, says American Iron & Steel Institute. Total more than equaled the combined payrolls of the years 1945 and 1946.

The past year's $3,355,543,000 payroll was half a billion dollars higher than the 1952 figure and nearly that much above the previous record year, 1951.

Average hourly payroll cost of wage earners in the industry rose to $2.267 for the year, an increase of 11.9 cents over the 1952 average. This average has almost doubled since 1943. December average was $2.279. With the inclusion of the cost of pensions, social security and insurance, on the basis of the 1952 average, the December cost per hour would be $2.449.

Wage earners worked an average of 37 hours a week in December and an average of 39.4 hours a week in all of 1953.

The estimated total employment in the year averaged 682,800, a new high. In December it was 655,800.

Alternate for Guaranteed Wage

AMA's Personnel Conference hears liberalized state unemployment compensation programs plugged as an acceptable substitute for guaranteed annual wage

INDUSTRY should back more liberal state unemployment compensation programs as an alternate for the guaranteed annual wage.

That idea, winning wide acceptance among industrial relations executives, is recommended by Dr. Sumner H. Slichter, Harvard University economist.

NEA

SUMNER H. SLICHTER
. . . his alternative to GAW pleases

It is recognized as desirable by unions who over the past eight years have changed their demands from the traditional idea of a guaranteed wage to one of supplementary unemployment compensation.

Foothold Year — Many of the 2000 industry representatives attending the American Management Association's Personnel Conference in Chicago Feb. 15-17 believe 1954 will be the year in which the unions will attempt to establish the principle of supplementary unemployment compensation under the name of the guaranteed annual wage. Their program will call for a contribution by employers to a trust fund out of which payments will be made to furloughed employees.

Industrial relations executives reason that the timing is right in 1954. The demand has been on union agendas for eight or ten years but never has been seriously pushed. It has been a softening-up process to acquaint workers and employers with the idea. Now with unemployment on the increase, and with the other segments of the union security program pretty well in place, the unions are in good position to press GAW demands.

Benefits—Some type of GAW would be good for the economy because it would provide a useful form of built-in economic stabilization, says Dr. Slichter. But current annual wage proposals have serious limitations. They are of limited scope and they would result in far more liberal benefits for some people than for others.

"Far preferable to a spotty extension of guaranteed annual wage plans would be a broad liberalization of the state unemployment compensation programs. But, until employers make an effort to persuade legislatures to liberalize unemployment compensation schemes, they are not in a good position to oppose the efforts of unions to accomplish the same results by collective bargaining."

Positive Approach—Participants in the AMA Conference agree that industry needs a positive approach to the 1954 bargaining on GAW, or more accurately, liberalized unemployment compensation. They should be planning now on how state laws can be amended to provide better benefits, and how any supplementary compensation from industry, if granted, can be integrated with the state programs.

Then they should be thinking about stabilizing production and employment.

Toledo a Labor Surplus Area

Toledo, O., with 16,500 unemployed Jan. 31, has been placed in Group IV (substantial labor surplus) by the Labor department. Detroit is also in Group IV.

Metalworking Industry Grows and Grows

IS THE METALWORKING industry your market?

If so, it would pay to take a new look at its growth. There were about 59,000 metalworking plants operating in the U. S. in 1951, more than twice as many as in 1939 and nearly 5000 more than in 1950.

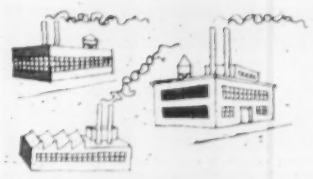
Tracing Growth—Over the five-year period from 1947 to 1951 the number of metalworking plants rose like this: 51,724 in 1947; 54,624 in 1948; 56,857 in 1949; 54,914 in 1950 and 59,357 in 1951. Though complete figures for 1952 and 1953 are not available, there is little indication that that growth in the number of metalworking plants has reversed itself during those years.

For example, the number of all types of business establishments, including retail outlets, has continued to increase to a record-setting 4.2 million in 1954, 200,000 more than in 1950, says Small Business Administration. And again, the number of all types of business establishments has more than doubled since 1910 when there were approximately 2 million businesses in operation.

Getting Specific—To gage the metalworking industry's growth it's necessary to know more than simply bulk totals. For one thing, you'll want to know in what states that growth has been the largest. The chart to the right breaks down increases in the number of metalworking plants between 1939 and 1951 by states. California, Illinois, Massachusetts, Michigan, New Jersey, Ohio, Pennsylvania and Texas have had the largest increases in gross totals though other states may have had larger growths percentagewise.

Important, too, in an analysis of metalworking's growth is the number of employees which have been added and the size of the new plants coming into operation. Metalworking employment rose 94.9 per cent to 6.5 million persons in 1951 from 3.3 million persons in 1939. That growth has continued and through June, 1953, had increased another 19.4 per cent from 1951 compared with a growth of 12.2 per cent for all U.S. industry during the same period.

These are the highlights of an analysis of metalworking's growth made by STEEL's Market Research Department. It indicates an increased potential for companies selling to metalworking plants if those companies know where to put the pressure for sales.



How Metalworking Plants Have Grown

STATE	1939	1951
Alabama	162	354
Arizona	18	111
Arkansas	32	109
California	2,297	6,323
Colorado	141	345
Connecticut	808	1,905
Delaware	17	78
District of Columbia	32	91
Florida	137	589
Georgia	169	416
Idaho	19	58
Illinois	2,919	6,078
Indiana	874	1,891
Iowa	307	610
Kansas	124	419
Kentucky	149	312
Louisiana	121	364
Maine	89	183
Maryland	326	563
Massachusetts	1,540	2,635
Michigan	1,797	4,923
Minnesota	517	996
Mississippi	39	132
Missouri	700	1,312
Montana	24	58
Nebraska	93	227
Nevada	4	18
New Hampshire	79	166
New Jersey	1,375	3,319
New Mexico	6	45
New York	3,921	8,118
North Carolina	151	428
North Dakota	15	36
Ohio	2,682	5,018
Oklahoma	184	417
Oregon	208	528
Pennsylvania	2,373	4,131
Rhode Island	263	607
South Carolina	43	111
South Dakota	11	40
Tennessee	177	429
Texas	513	1,539
Utah	48	129
Vermont	52	84
Virginia	170	323
Washington	390	745
West Virginia	115	219
Wisconsin	917	1,807
Wyoming	9	15
TOTAL U. S.	27,187	59,357

* Not including metalworking plants producing ordnance or miscellaneous metal products.

Source: 1939 data from 1947 U. S. Census of Manufactures. 1947-1951 data from County Business Patterns.

Truckers Take to Seatrains

Rising road taxes prod plans for ocean-going, truck-carrying ships

PROSPECTS have suddenly burst into plans for more sea-land truck transporation hookups along the pattern successfully set by the seatrain lines which have been operating for some time between New York and Texas City, Tex.

Prime reason for the trend to combination use of trucks and truck-hauling ships is the desire to resist the rising road taxes that have to be borne by truckers. That includes gasoline taxes, state license for the states, traverse and toll charges on many new highways.

Three on the Way—Three projects are now being worked on. All call for "roll-on, roll-off"-type ships sought by the Army under the National Security Program. Fast amortization is being sought in all three cases and government loans as well in two cases.

McLean Trucking Co., Winston Salem, N. C., large eastern trucking firm, has applied to the Interstate Commerce Commission for permission to acquire the S. C. Loveland Co. Inc., Philadelphia, operator of ships in deep sea and inland waterways traffic. McLean proposes to build four, 650-foot, 20-knot ships, designed by Bethlehem Steel Co. Shipbuilding Division. Each would have capacity for 240 truck-trailers and cost about $5.5 million apiece. Plans call for six round-trip sailings per week between Providence, New York and either Wilmington, N. C., or Charleston, S. C. McLean proposes to finance with private capital.

Without Highways—Delaware & Alaska Corp., Houston, has plans to construct three "roll-on, roll-off" ships which are to ply between New

York and Houston. It seeks a government loan. Ingalls Shipbuilding Corp., Pascagoula, Miss., which would build the ships, would take a 10-per-cent financial interest.

The Newtex Corp., subsidiary of the Sword Line, New York, seeks a government loan of 87½ per cent of the cost of two seatrain truck-trailer ships to cost around $9 million each which it proposes to have built for use between New York and Houston.

Labor Approves—The AF of L Teamsters Union has endorsed these plans to cut transportation costs by ferrying truck-trailers by ship. Says Dave Beck, union president, "We expect it will temporarily displace some of our truck driver members, but . . . in the long run it will mean a tremenduous increase in jobs for drivers."

Pittsburgh Cold Mill Ready

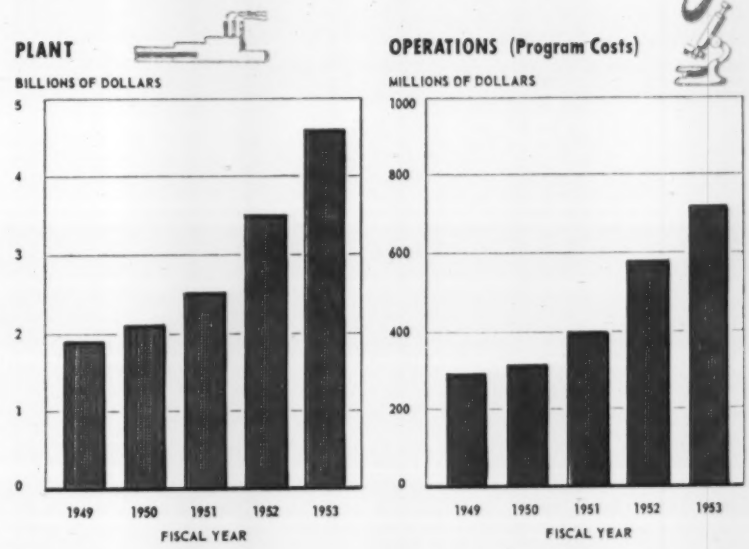
Pittsburgh Steel Co. will start production of cold-rolled sheets and strip at its new $42-million Allenport, Pa., plant Mar. 1—with a two-month order backlog.

The cold mill is adjacent to Pittsburgh's 66-inch hot strip mill that went into operation last May. Hot-rolled coils will be cold-reduced on a Bliss 4-stand tandem mill in widths ranging from 20 to 60 inches and in thickness from 24 to 16 gage. The mill was designed with exceptionally rugged housings so that thinner material may be rolled. Foundations also are in place for two additional stands so that the mill may be readily adapted for production of tin plate. It is the first cold mill to be equipped with Westinghouse magnetic amplifier controls.

For further processing, the cold mill department has a Bliss 4-high temper mill for handling both sheets and coils; two Aetna-Standard flying shear lines for producing sheets in cut lengths from 2 to 16 feet and an Aetna-Standard slitter for coil stock down to 6 inches wide. Ten Swindell furnaces with 25 bases have been installed for annealing coils and two furnaces with six bases for annealing sheets.

Hot-rolling capacity of the new plant is 50,000 tons a month, cold-rolling 40,000 tons. Provision has been made for future expansion.

Mushroom Growth in Atomic Energy



Atomic Energy: A Big Business Getting Bigger

CAPITAL INVESTMENT at the rate of $100 million per month during the past six months, appropriations in fiscal 1953 of $4.1 billion—that's the picture of the government's atomic energy program, one of the nation's biggest businesses.

And, according to the latest semi-annual report of the Atomic Energy Commission, the program and private industry's participation in it is going to get even bigger.

Construction—One of metalworking's biggest stakes in the program at present is in plant construction and equipment. Capital expenditures for atomic facilities are expected to average $115 million monthly in the first half of 1954. As of last November, atomic energy capital investment totaled $5.1 billion (before depreciation reserves). Largest construction project under way is near Portsmouth, O., where some 26,000 construction workers will be employed at the peak period this year.

Continued emphasis on discovery, development and production of uranium from domestic sources was also assured when the AEC extended to February, 1957, the time during which initial production of uranium ore from U. S. mines will be eligible for bonus payments. Guaranteed minimum price schedules for uranium ores on the Colorado Plateau were extended to Mar. 31, 1962. AEC reports that ore is currently being produced from 525 mines, mostly on the Colorado Plateau. There are nine ore-processing plants in the nation and construction on the tenth to be located at Shiprock, N. Mex., will begin early this year.

Isotope Uses — Significantly, industry is the greatest user of isotopic materials. The second largest application is in the field of medicine. By the end of 1953, 1858 institutions in the U. S. had been authorized to use reactor-produced radioisotopes.

The program for developing improved reactors for industry and military uses is also pushing ahead, AEC says. Westinghouse Electric Corp. has been selected to construct the first full-scale nuclear power plant and there are eight industry teams studying reactor designs and surveying reactor technology.

Industry Contact—Serving as a contact point between AEC and industry desiring to explore commercial applications of atomic energy is the Office of Industrial Development. Small business, too, is participating in the atomic energy program. According to AEC, direct contract awards of $117 million and subcontracts totaling $628 million went to small concerns from July 1, 1951, to Sept. 30, 1953.

Rare Earths Improve Steel Workability

Desulphurization, increased fluidity are promoted by rare earth additions. Success with stainless gives promise of low-carbon steel applications

EVIDENCE presented to last week's annual meeting of the American Institute of Mining & Metallurgical Engineers in New York showed improved hot workability of stainless steels is achieved with rare earth additions to furnace melts.

The technique shows promise of successful application to low carbon steels, which could result in more shippable steel per heat.

Exit Sulphur—Revealed at the meeting was a report of fundamental research into desulphurization of steel by rare earths, carried on at the University of Pittsburgh under sponsorship of Molybdenum Corp. of America. Dr. Alfred J. Berger, head of the university's metallurgy department, told how rare earth metal added to steel of known suphur content produced an immediate sulphur reduction of at least 50 per cent within two minutes of addition and complete reversion of the sulphur within approximately 20 minutes.

Because of the steel's increased fluidity, researchers found they could make additions at lower temperatures, achieving the same reduction in two minutes. Recovery rate was slower, however, and complete reversion was not effected.

Enter Stainless—Practical experience gained in heats of stainless steel at Allegheny Ludlum Steel Corp. was reported by Robert H. Henke, manager of quality control. He found steels of single phase composition (ferrite, austenite) had greater ductility at hot working temperatures and could be reduced in size better than those of mixed phase with one phase stronger than the other. Rare earth additions, he said, tended to reduce the effect of one phase in presence of the other at hot working temperatures.

Mr. Henke reported the rare earth oxide compounds did not produce segregated areas that were common to the metal additions. While positive evidence of production of fine grain steel was not found, the company recognized enhanced hot workability was produced by some form of nucleation.

Nucleation—The term nucleation is bothersome to metallurgists. "If effect is to produce finer grain size upon primary crystallization and cooling, then it's nucleation," Norman F. Tisdale, vice president-sales, Molybdenum Corp. of America, told STEEL. "Our oxide compounds don't remove inclusions but scatter them so they don't hurt." His company has concentrated on the low carbon steel field.

Price of the rare earth oxide compounds has come down from $3 to its present level of $1.50 a pound because of greater recovery of rare earth material from ore and increased use.

Officials of the company state an average of two pounds of the compound is required per ton of steel and note the possibility of reducing this further by greater efficiency in making additions, with some tests reported successful using 1.25 pounds per ton.

Metallurgists expect to gather more working information on low-carbon open-hearth steels from a comprehensive report on operating experience scheduled for presentation at the National Open Hearth Meeting in Chicago, April 5-7.

Mechanical brain-sweating is a big drawing card as . . .

Electronic Computers Take On More Jobs in Industry

ORIGINALLY DESIGNED to help win wars and solve intricate mathematical formulas, electronic computing equipment is exerting even greater influence on manufacturing and business today.

Over 5000 manufacturing executives and businessmen had a chance to see the latest advances in automation and computing equipment last week at the Second Western Computer Conference in Los Angeles. More than 25 firms showed their latest innovations and had scientists and engineers on hand to explain the devices.

Among the attention-getters: Remington Rand Inc.'s UNIVAC which is designed to handle record-keeping, analysis and engineering jobs; Burroughs Corp.'s digital computer; Logistics Research Inc.'s general purpose digital computer and magnetic library system which uses new principles for filing information.

Patent Policy Gets a Facelifting

It's not on the books yet, but the Defense department plans a revision to defense contractor's patent right regulations. Ambiguous "Little d" paragraph is omitted

SOME major objections of industrial contractors to Section IX of the Armed Services Procurement Regulation (covering patents, copyrights and technical data) are overcome in a revision of that section by the Defense department's general counsel.

The revision, now being reviewed by the three armed services, results from an intensive study started in the fall of 1951. Not only interested government officials but the industries most concerned participated in the study. It is expected to be published this spring in about its present form.

Not Settled—Still open, in Part 1 (patents), is the question of inserting a policy statement favoring the placing of a contract with the patent owner rather than his infringing competitor. Inclusion of that policy seems unlikely, however, since the general counsel stipulates that "the government should obtain the best supplies it can, whether or not the supplies are patented, provided the government pays reasonable compensation for the infringement."

The provision under which the contractor is called on to indemnify the government against liability for infringement of a patent in the production of standard commercial articles has been liberalized. For example, the indemnity is removed from methods and tools used by the contractor, under both construction and supply contracts. The indemnity does not apply where there is a change in the "manner of performance"—as a change from riveting to welding. This section contains a new contract clause for use when the government assumes the infringement liability.

Freedom in Research—The authorization and consent section allows greater latitude to experimental, developmental and research contractors than to supplies contractors in the use of patented inventions without liability to the contractor.

The question of patent rights is clarified by a simple policy statement: The government receives patent rights to inventions first actually reduced to practice in the performance of a research or development contract—unless a patent application was filed prior to the contract. But the contract price may not be increased by reason of a patent rights clause.

The language of the revision upholds the principle that it is to the government's interest to place research or development contracts with contractors who know the most about the subject and hence are apt to have more patents. That's true whether or not the patents have been reduced to practice.

Overruled—The revision rules out industry's objection to the government policy of requesting title to foreign patents. It's pointed out that the government goes after foreign patent rights only after the contractor has failed to exercise his option to file in foreign countries.

Another change provides that it is not necessary for the government to have title to a patent; a license to the government in most cases is sufficient. This is held true even when the contractor has received substantial government aid to perform his contract.

Reasonable Redress — The revision discontinues the practice of obtaining a government license under background patents of the contractor when developing an article of supply. "It is the policy of the Department of Defense to pay a reasonable compensation for the use of an invention covered by a valid patent enforceable against the government."

The section dealing with atomic energy research and development contracts has been liberalized to allow the contractor, "in appropriate instances," to retain patent rights where the field of research is not primarily concerned with atomic energy.

More Coming—The much-criticized, ambiguous "Little d" paragraph of the present Section IX has been deleted from the patent rights contract clauses. The entire subject of technical data is treated separately in a new Part 3 of Section IX, a summary of which will appear in a subsequent issue of STEEL.

Army Tries Bridges that Roll and Fold

New look in military bridges is revealed in this photograph of experimental structures undergoing tests at the Army Corps of Engineer's research laboratories at Fort Belvoir, Va. In foreground, a span which rolls to the site on its own wheels; it can support 60 tons. Center, a scissors-type bridge, riding pick-a-back on a special carrier. At far right, an all-aluminum bridge

By E. C. KREUTZBERG *Washington Editor*

Coming Up: Aid on Marketing, Transport, Freight Absorption

WASHINGTON IS A TOWN that's usually hip-deep in reports and investigations, but two reports and one long-term investigation are coming up that should not be overlooked.

A significant report will come from a committee headed by Ralph Watkins of Dun & Bradstreet Inc. An important recommendation by this group after an intensive study of the Census Bureau will be that both a census of manufactures and a census of business be conducted in fiscal 1955, based on operations in 1954.

The committee will point out that the spot surveys now being conducted by the Census Bureau, while helpful, do not include the detailed information which is revealed by full-scale censuses. Also commented upon will be the undesirable lack of information in these areas because the last census of business was conducted in 1949 and the last census of manufactures in 1948. The need for this type of information, the committee will point out, is pressing right now because most commodities are in a buyers' market.

The recommendations have the approval of the National Distribution Council, the Commerce department's advisory group on distribution problems. The council looks ahead to these censuses as mines of information to be put

to practical use in developing marketing plans, setting sales quotas, locating branch sales offices and warehouse stocks and in other ways expanding business through various sales promotion programs.

The House Appropriations Committee has been apprised of the need for these censuses and is to be asked for a supplemental appropriation to cover them—possibly in excess of $20 million. Favorable action is expected, since the appropriation was due last year but was skipped pending completion of the Watkins committee's study.

The Census Bureau also plans to conduct in fiscal 1955 a sample census of agriculture and the regular spot surveys of business and manufactures. The regular budget request includes $3.5 million for the former and $650,000 for the latter.

U. S. Shapes Transport Policy . . .

Another Commerce department study of wide significance to industry is the one under way by

the advisory group known as the Transportation Council. It is due to report soon on the needs of all forms of transportation, after which Robert B. Murray Jr., undersecretary of Commerce for transportation, will draft a report to Congress. This will recommend a comprehensive federal policy in regard to transportation in general.

Clarification Pends . . .

The important long-term investigation pending regards basing-point and freight-absorption legislation. In fact, the study is so long-term that it's questionable whether the final outcome will materialize at this congressional session. Hence, don't look for any clarifying laws on this matter in the near future.

The House Judiciary Committee has tentatively scheduled consideration of the need for clarifying legislation for about Mar. 15. But

it believes that a lot of ground must be covered to develop a statute that will be realistic. Much more is required than to act on the five bills now before the committee.

"A sensible and practical approach to the basing-point problem," says Rep. Chauncey W. Reed (R. Ill.), chairman of the committee, "will ascertain the changes in industry in order that legislation can be current, relevant and objective. Industry-by-industry the extent to which freight absorption and delivered pricing are factors must be determined, and their effect upon regional development, full employment, technological innovation and industrial organization should be ascertained. Only in this way can we give our businessmen comprehensible as well as comprehensive legislation.

"Factual gathering of this scope is no modest undertaking. Resort to the full resources of administrative agencies schooled in the industrial problems of freight absorption and the problems of meeting competition will be necessary. So too would it be advisable, if not essential, to secure the tangible assistance of those whose operations may be vitally affected by the actions of Congress in this field. For it is only with the cooperation of industry itself that we can obtain accurate as well as current data relating to present-day business operations and practices."

McKAY PRESS FEED AND CUT-UP LINES

WASH THAT DIRTY STRIP BEFORE SHEARING and BLANKING

The latest development in McKay coil feed lines is this new strip washing machine which thoroughly cleans the strip after it leaves the coil and before it passes through any subsequent feed rolls.

In most stamping plants a sizeable portion of metal finishing costs and quality control problems can be traced to the fact that some coiled steel is dirty and much of this dirt picks up on the rolls of the processing equipment. The dirt which carries over on the blanks may cause scratches in the drawn panels during the forming operations.

In several recent installations McKay has furnished a strip washing machine which utilizes high speed brushes and large volume solvent sprays to thoroughly clean the steel strip at high production speed.

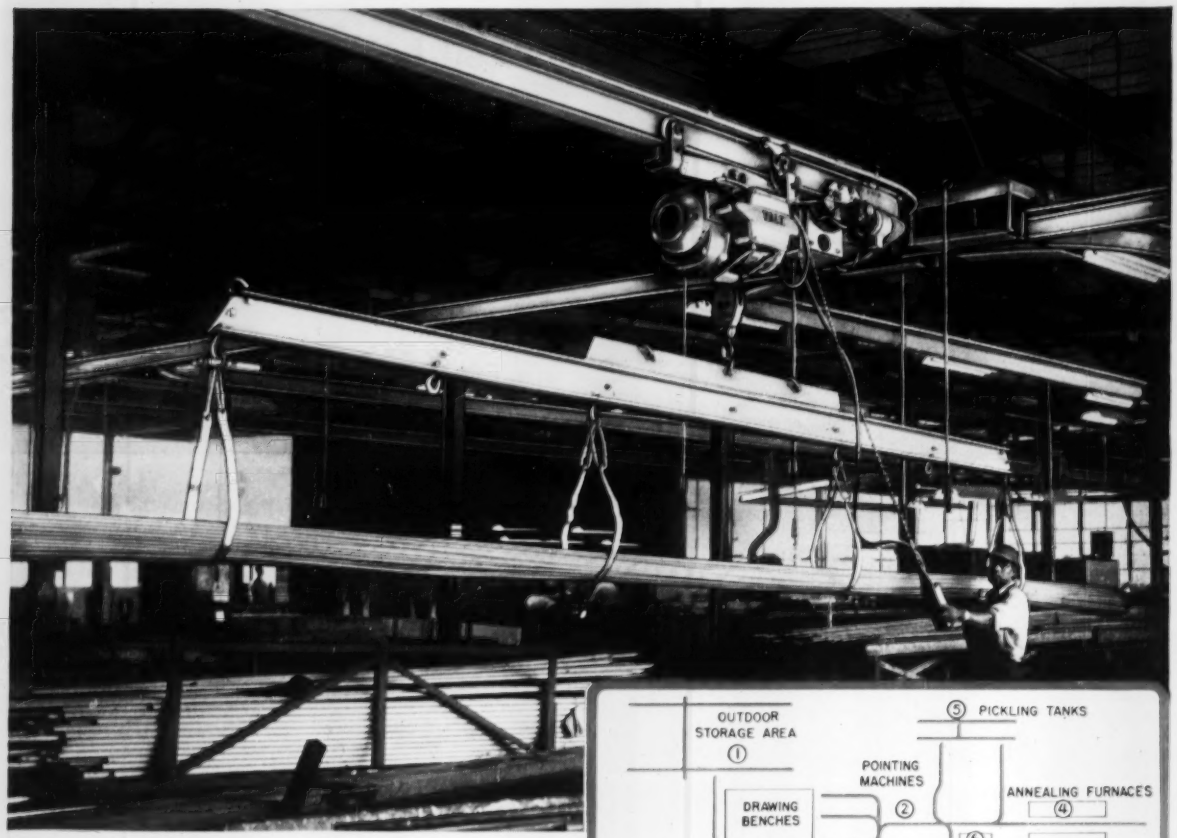
CONSULT McKAY ENGINEERS IF YOU HAVE A PRESS OR SHEAR FEEDING PROBLEM. WE INVITE YOUR INQUIRIES.

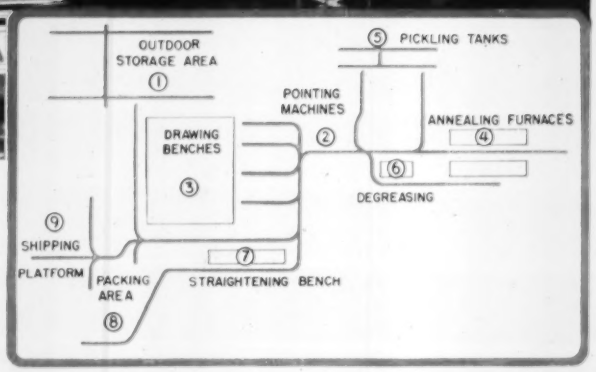
The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

You can do it better with Louden engineered monorail!





Hard-to-handle materials or shapes? Let Louden's long experience lick it.

Louden pioneered monorail handling. This longest and broadest experience with this most adaptable and most flexible of all materials handling methods naturally offers many *extra* benefits to men seeking answers to any handling problems. Shown above is part of a Louden SuperTrack System in a well-known eastern factory where a Louden MotoVeyor makes easy work of the speedy handling of long, flexible, easily-damaged tubing. The hoist has 2,000 pounds capacity and the MotoVeyor travels at 125 feet per minute. This Louden Monorail System also connects with the pickling house where a Louden Monorail Crane speedily and safely handles various sizes of tubing through the series of vats. Benefit by Louden experience on YOUR next handling problem.

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SEND FOR THIS BOOK— Write for your copy of "Economical Material Handling" . . . full of time-saving, cost-cutting ideas and case histories. Free . . . no obligation.

Louden
MONORAIL & CRANES

Since 1867—the first name in materials handling

Hamilton-Wright

A mountain will move smoothly to the sea as . . .

Radio Expedites Venezuelan Iron Ore

An operator at Puerto Ordaz will be able to throw the switches anywhere along the 90-mile railroad from Cerro Bolivar by means of microwave radio impulses

MICROWAVE RADIO will be used to control movement of iron ore from Cerro Bolivar to Puerto Ordaz over a 90-mile railway in Venezuela.

The radio remote control and communications system is a joint project of Radio Corp. of America and the Union Switch & Signal Division, Westinghouse Air Brake Co. It will be installed for the Orinoco Mining Co., a U. S. Steel Corp. subsidiary.

High Jump — The microwave project calls for the installation of broad-band radio equipment capable of carrying the microwave channel, both transmitting and receiving VHF-FM, at both Cerro Bolivar and Puerto Ordaz. Each of the two locations will be equipped with transmitters, receivers and high gain antennas. These will operate on "eye-level" transmission and reception even though the altitude rises from 100 feet above sea level at Puerto Ordaz to more than 2500 feet at Cerro Bolivar.

Transmitting and receiving towers will also be constructed at each of four sidings along the right-of-way. To control the two sidings nearest Puerto Ordaz, a control panel there will transmit coded pulses over a three-mile multiconductor cable to the radio tower location. These pulses will key a 2.9 kilocycle transmitter which, in turn, will modulate another transmitter. Receivers located at the sidings will pick up the code indications and operate the signals and switches accordingly. The two sidings near Cerro Bolivar will also be controlled from the panel at the port.

Quick Response—Only seconds will elapse between the time the Puerto Ordaz operator flicks a lever and the time the switches at the sidings nearest the mine complete their movements. Codes indicating a train has cleared a siding are flashed back to the operator almost instantaneously.

Roller Coaster in Britain

British tinplate production took a roller coaster ride during 1953. The tinplate industry turned out only 825,000 tons in 1953 which was 165,000 tons less than in the previous year. The drop was due to a sudden recession in orders in the spring of 1953.

In January of that year there were 180 mills in operation in Britain. By June the number fell to 97, only to recover again to 113 by the end of the year. Although 4900 tinplate workers were let out during the first six months of 1953, only 138 were registered as unemployed by mid-November. Part of the difference was made up of Italian workers who returned to their own country.

A significant factor in the experience of the British tinplate industry is the growth of tinplate works in countries which heretofore imported British products. Australia, for example, is building a tinplate mill with 165,000-ton capacity. In 1952, Australia bought 84,700 tons of British tinplate or nearly one-fourth of Britain's total exports for that year.

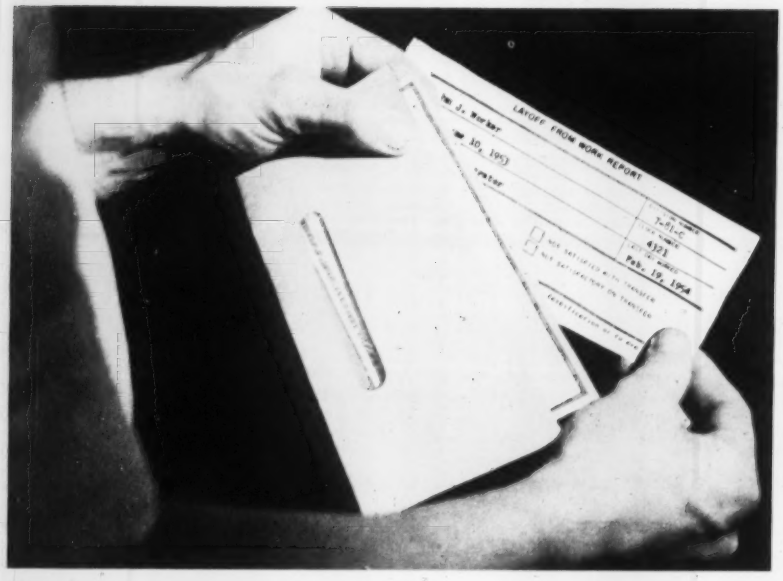
British tinplate producers are keenly aware that they must find new export markets to replace those like Australia or face more breath-taking roller coaster rides in the future.

Watchmakers Seeking Relief

The Federal Tariff Commission is again hearing arguments in favor of higher duties on Swiss watches and watch movements from members of the U. S. watch industry. Specifically, Elgin National Watch Co., Hamilton Watch Co., and Waltham Watch Co. want duties on foreign watch units increased by 50 per cent. Even if the tariff commission decides in favor of such "relief," the President would have to approve.

International Co-operation

Societe Etilam, Jeumont, France, increased over-all plant production by 25 per cent through truly international engineering. A 20-inch thin-strip Y-mill was supplied by Mackintosh-Hemphill Co. and electrical equipment by a German firm. Etilam supplies finished strip to French metalworking fabricators, adding to the international flavor.



Layoffs: Nobody Likes Them, But—

Today's employee understands better the layoff picture, thanks to better labor relations and seniority clauses. Here are the most accepted layoff policies

YOU CAN AVOID many headaches in one of management's most unpleasant tasks—the layoff.

With unemployment about 2.5 million, executives today are faced more frequently than at any time since 1949 with the disagreeable situation. It never has been and never will be fun for anyone concerned, but there are ways to give psychological and material help to an employee that will cushion the blow of his layoff.

Progress—Management has already made some advances. It used to stick its neck out when it gave an employee the ax. Even though they recognized the layoff as necessary, the employees involved got little or no advance notice and no satisfaction as to why they had been selected. Workers remaining on the job frequently felt that their buddies had been dealt with unfairly, and the effect on morale went deeper than the basic economic fact of layoff.

Current pattern in the auto industry where layoffs have been increasing is on a basis of seniority within different skills and occupational groups. This means that a young man with the "ability, merit and capacity" can move ahead, and it gives him an incentive to do so if he's shy on seniority. It protects management in that men with ability can be held within the organization through advancement, overcoming the traditional disadvantage of straight seniority layoffs. In most areas of metalworking seniority rules in determining the order of layoffs. Employee skills are the second most important consideration in the order of discharges. Share-the-work plans are the third most important factor affecting layoffs.

Shorter Weeks—Shortened work week practices are generally followed in seasonal industries and initiated by management. One UAW local president terms it "sharing the poverty." Workers in rural or suburban areas are generally more willing to go along with work-sharing plans because they have a closer relationship with fellow workers both inside the plant and out.

The same practice is used by larger companies, too, in temporary reduced-production periods. Studebaker Corp. is a case in point. It maintained a 32-hour two-shift operation for nearly a month before it decided to lay off between 2500 and 3000 night workers and consolidate operations into a single day turn on Feb. 16. Company-union contract seniority provisions set up the method of absorbing night seniority workers into the day turn.

Other practices include the long week ends during holiday periods; the shorter working day which has some psychological value, though it amounts to a shorter work week; and the more radical plan of rotating work weeks whereby one shift works one week and is off the next. This is considered a "depression practice" and is being utilized

Do Your Layoff Policies Reflect Good Labor Relations?

Does the seniority provision in your union contract permit use of the ability factor as a consideration in layoffs?

Does your layoff policy permit a shortened work week during temporary reduced-production periods rather than outright layoff so that your labor force is kept intact?

Do you give the employee at least a week's notice of his layoff?

Do you conduct a personal layoff interview, explaining to the employee why the layoff is necessary, how it will affect his status with the company, what his unemployment benefit rights are and how to apply for them?

Do your employees fully understand your layoff policies?

in some brass companies in the Waterbury, Conn., area.

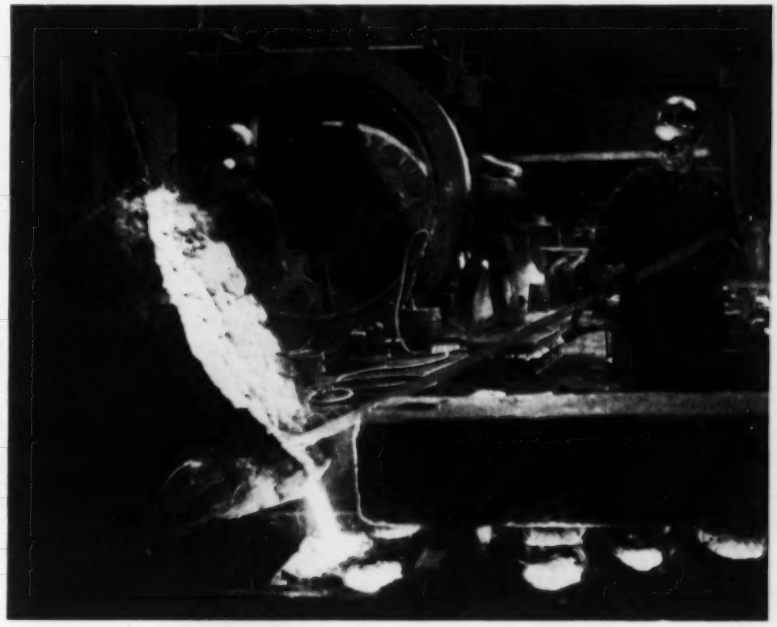
An Angle—An ingenious device employed by a large company in 1949 set up a four-day work week but kept up the worker's pay. This was done by giving earned vacation pay for the fifth day; then if vacation pay was exhausted by the time vacations came up, the worker was eligible for immediate unemployment insurance. If the need for layoffs had stopped by vacation time, the worker could work right through the period and get paid for it.

A practice gaining popularity is one employed by American Steel & Wire Division, U. S. Steel Corp. All employees who are laid off are given their notice personally by the supervisor or foreman who explains the reason for the action. The Company insurance plan and how the layoff will affect it and the employee's rights to and method of securing unemployment insurance are also discussed.

Common Practices — A study made in 1949 shows that about 25 per cent of collective bargaining contracts had plans for work sharing; 30 per cent allowed bumping, whereby workers whose jobs are eliminated are given the same claim on jobs held by junior employees; 25 per cent provide extra protection for union representatives during their terms of office; and over 80 per cent called for advance notice of layoffs, generally about five days.

Some companies add a plus factor in their labor relations during periods of layoffs. Apex Electric, Cleveland, in 1949 set up an employment bureau to help place workers it was forced to lay off in other jobs. Another midwest manufacturer who found that his defense contract was being cut obtained a three-week extension to give his employees holiday pay and during the period scoured the area for jobs for his displaced personnel.

On the Other Foot—Much can be gained labor-relationswise if management has a fair layoff policy that its employees understand. Perhaps the best method for setting up such a policy, says one personnel director, is to place yourself in the shoes of the employee who is about to get the ax.



Jones & Laughlin

Adjustment Hits Steel Foundries Hard

STEEL FOUNDRIES have been living out of the cupboard since early 1953.

While output dipped some (about 25 per cent from January to December, 1953), backlogs of unfilled orders shrank twice as much (54 per cent from January to December, 1953, according to the Steel Founders' Society of America, Cleveland).

Common Knowledge — Steel founders expected that their business adjustment would be greater than that of metalworking industries generally. Big customers include many heavy machinery and equipment makers, the railroads, and combat tank producers among defense contractors. A 5-per-cent dip in over-all business would, it was expected, hit those industries harder and reflect itself in about a 20-per-cent decline for steel foundries.

Many steel founders are now saying, however, that they've adjusted about as much as they intend to. With backlogs low, the work week down to 5 days or less, defense work amounting to 5 per cent of total business compared to 20 per cent a year ago, these foundries are ready to fight for every dollar of business they can get.

Firm Prices—That means larger foundries are taking smaller jobs which they might have overlooked before. Smaller foundries, forced to sell further from home and harder, are adding salesmen and urging potential customers to allow them at least to quote on new parts to be made as castings. All this might spell softening prices, but high costs generally are keeping prices firm. Only on large-quantity, single orders has the pressure for price considerations been effective thus far.

Will the end-the-adjustment spirit of some steel foundries pay off? R. G. Ullman, sales manager, West Steel Casting Co., Cleveland, says: "We've put on more salesmen. We're knocking on doors. With so much emphasis on aggressive selling in 1954, some companies are going to have much better operations than others. We are now, at least, holding our own with last year."

Another positive approach to the problem is voiced at Blaw-Knox Co.'s rolls division where extensive capital improvements have been made. Says P. M. Flemming, vice president and plant manager, "We believe that when you achieve quality of product, you secure your full share of orders."

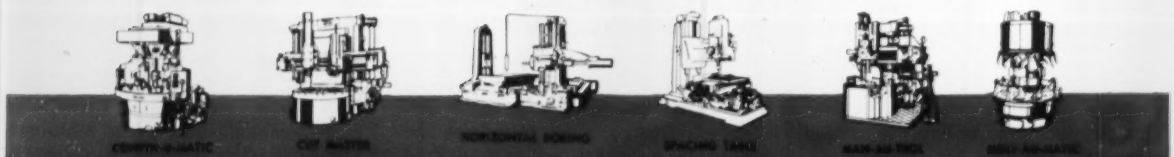
you have PRECISION at your finger-tips with a BULLARD SPACER

A call to your BULLARD Representative will convince you of the savings a Bullard Spacer will effect in your manufacturing methods, or write to...
The Bullard Company
Bridgeport 2, Connecticut

In plant after plant, in many diversified industries, The Bullard Spacer, day after day is convincing management and shop people alike, that where precision counts it is a "natural."

At the San Diego Division of Convair, a machine shop Superintendent says: "We have found the Bullard Spacer very useful in our work. The machine is simple to operate. It eliminates the necessity of zeroing to a set position. And there is no chance for error, which is important when you make accurate parts for airplanes."

Accurate and precision drilling, reaming or tapping to exacting standards on difficult pieces without the high cost of jigs or fixtures, is maintained with a Bullard Spacer.



THE BULLARD COMPANY · BRIDGEPORT 2, CONN. Telephone 6-2511

Stock Cars Roll on Florida Sand To Get More Speed—and Sales

DAYTONA BEACH, FLA.

DAYTONA BEACH is a real juke box as cities go—gaudy, but full of records. The former it owes to the peculiar American tourist. The latter to nature.

For though the tearing torque of trying tires may leave the sand in ruts one day, drivers return the next to find the tide has provided them with a brand new course.

For the Record—Almost since the beginning of the automobile, drivers have come to this strip of sand 500 feet wide and 25 miles long to answer that familiar question, "What'll she do?" Alexander Winton's answer in 1903 was 68 mph. Barney Oldfield replied 131 mph in 1910 and Sir Malcomb Campbell had the last word with 276 mph in 1935 when the practical speed limitation of the beach was reached.

But those were racing cars, and during the past week the sands were tormented by less potent, but more relevant machine. The occasion was the fifth annual speed week sponsored by NASCAR, the National Association for Stock Car Auto Racing Inc. The festivities featured time trials for sports cars and American passenger cars just like the one you may be driving. And not only was the town filled with only slightly embarrassed factory men from Detroit who had come down to see how the "privately-entered" cars ran, but many a top-echelon automaker publicity man was on hand to point to his firm's pebble on the beach.

Not Bragging, But—Some years ago, you see, the auto companies agreed not to advertise top speed, but an awakened interest in automobile performance coupled with increased selling competition "makes it worthwhile to point out the accomplishments of our products determined by an outside source," as one publicity man so adroitly expresses it. Which is another way of saying that if top speed figures will sell cars the automakers are not averse to punching a peephole in the bushel that hides their light.

More Sales in Color

Selecting the car finish to whet your car-buying appetite is almost as involved as a woman's hat-buying spree. E. N. Cole, left, chief engineer, and W. E. Fish, general sales manager, go over 390 miniature car models, each painted a different color, to choose the color lines for the 1954 Chevrolets

Within the fundamental framework of selling cars, however, individual companies probably have their own private reasons for wanting such information known. Cadillac, for example, would perhaps like to reassure its owners that it is the standard of the world. Packard with its experimental Panther is probably emphasizing the fact that it has engineering and design know-how of big-league calibre. Dodge, having switched from the car for the conservative to the car for the young in heart, dramatizes its new hotness in all probability. Hudson and Oldsmobile sustain the impression that they are both bomb-builders. Buick makes it clear that Dynaflow doesn't drool at the top end and Lincoln connotes that the Mexican road race win was no fluke.

The Meaning—That, roughly, is what speed week means to the auto companies. Not so clear is what it means to you. It does dramatize the fact that while horsepower is going up top speeds lag most expectations. It's hard to realize it takes about 70 horsepower to increase the top speed of your car 10 miles an hour. It also indicates that your speedometer is off about 10 per cent at the top end and will probably settle some bar stool arguments about who went how fast on the turnpike.

But although these cars are strictly stock, they are somewhat unusual. Fortunately they are less so than they used to be and the trend is further in that direction. The 1953 Olds 88 which averaged 113.38 mph to set a record last year was one of six specially built cars. It had a numerically lower rear end ratio, solid valve lifters and 0.004-inch honed clearance in the cylinders. In addition the car was run with 70 pounds of air in the tires and with the distributor set just below the point of ping. This year the special kits are out unless they are nationally advertised and available through dealers such as Hudson Twin-H Hop-ups.

The Conditions—High tire pres-

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The Fastest Cars

1954 Daytona Beach Speed Trials

(Speed listed is an average of two runs, one north and one south)

Make	MPH
Ferrari	134.93
1953 Jaguar Coupe	127.33
1954 Chrysler Coupe	117.06
1954 Cadillac Coupe	113.63
Packard Panther	110.97
1954 Buick Century Coupe	110.42
1953 Nash Healy	108.98
1954 Oldsmobile Coupe	108.87
1953 Chevrolet Cad-Corvette	108.69
1954 Chevrolet Corvette	107.71
1954 Dodge Royal Sedan	105.88
1954 Studebaker Commander	98.55
1953 Mark VII Jaguar Sedan	96.91
1954 Mercury Sedan	96.66
1954 Lincoln Capri	94.99
1954 Ford Sedan	89.27
1954 Nash Rambler	86.89

sure ranging from 50 to 70 pounds were used by most drivers and the cars were tuned to get the most at the top end of the power curve. Runs were made in most cases with the model which offered the least frontal area, often hard tops rather than sedans. And as the absence of many makes indicates, heavier cars have the edge when it comes to top speed, so lighter cars were not entered.

But tuning and tires make a difference of only about 5 miles an hour over a normal car in good shape running on concrete, believe the tuners working on speeds beyond the decimal point. So if your car is listed in the accompanying table it isn't stretching a point too much to say that's what your car will do. And if your car is an earlier version, knocking off one mile an hour for every seven horsepower you don't have may give you a rough estimate of where you stand, other things being equal. Then, too, it isn't impossible that your speedometer is wrong.

Cuts Power Steering Price

Hudson Motor Car Co. has reduced prices for power steering units offered as optional equipment on its 1954 Hornet, Super Wasp and Wasp models.

Hudson power steering for the Hornet will carry a list price of $150.08. Power steering for the Wasp and Super Wasp will list at $142.04. Both prices include provisions for federal excise taxes. Power steering for all three models formerly listed at $177.38.

Hudson also announces that the Air Force has confirmed a new defense contract for "many millions of dollars" with Glenn L. Martin Co. The new contract calls for "substantial additional quantities" of airframe components for Martin's B-57 night intruder bomber. A spokesman said the new contract will sustain Hudson's defense production and employment well into 1955.

The Air Force confirmation replaced a letter of intent under which Hudson had begun production programming and material procurement last October for the additional units in the new contract.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,679	614,000
February		623,793
March		752,474
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		528,681
Total		7,830,746
Week Ended	**1954**	**1953**
Jan. 16	149,841	148,049
Jan. 23	146,741	149,550
Jan. 30	143,654	150,289
Feb. 6	138,987	146,809
Feb. 13	140,616	147,103
Feb. 20	140,000*	161,860

Source: Ward's Automotive Reports
*Estimated by STEEL.

Twin Coach Branches Out

Twin Coach Co., Kent, O., reportedly has purchased the parts and service business of ACF Brill Motors Co., Philadelphia.

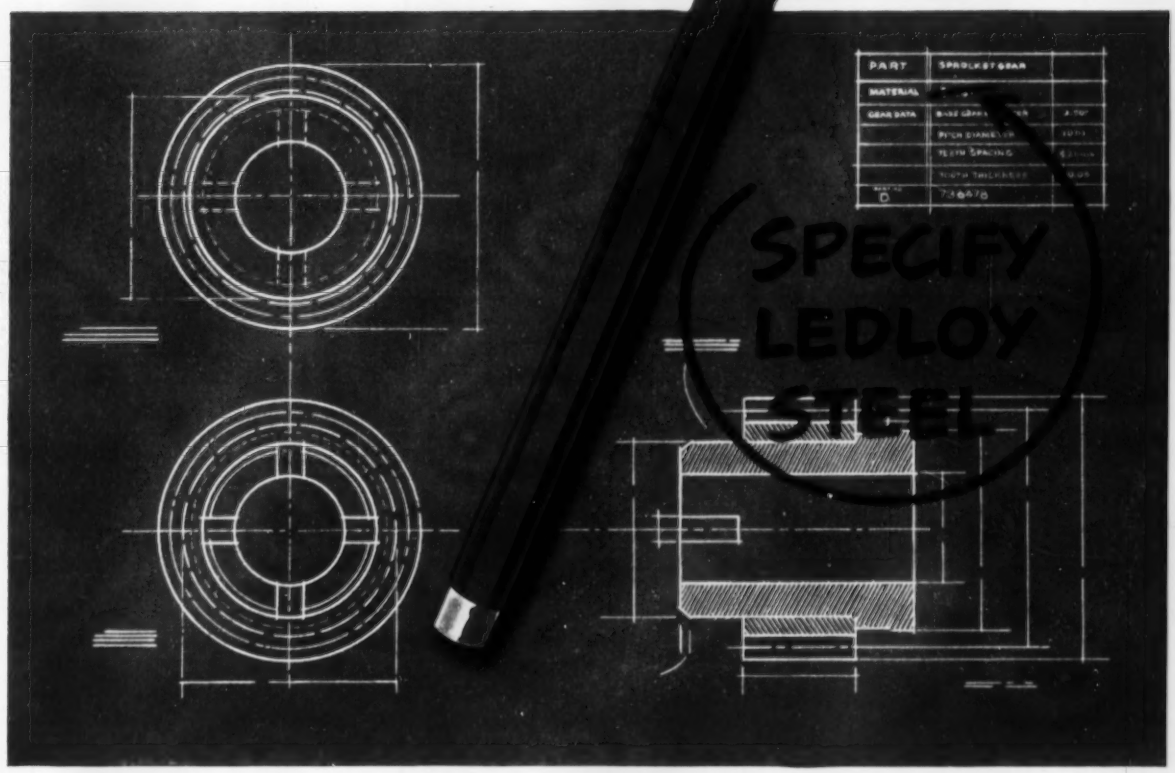
While Twin Coach officials last week would not comment on the reports, it is understood that the Kent firm will take over the entire staff and facilities of Brill's parts and service department and will operate the newly acquired business as a division after Mar. 1.

Jeep Cavalcades Plan Foreign Tours

First of four Jeep cavalcades which will visit 25 foreign countries this year makes a cross-country trial run near San Antonio, Tex. The convoy, sponsored by Willys Motors Inc., consists of Jeep fire engines, ambulances, well-driller, cargo-personnel carrier, welder, air compressor, trench-digger and all-purpose farm vehicles. It will shortly start an extensive Latin American tour. Other cavalcades are slated to visit Canada, Europe, Africa and the Far East

HOW TO INCREASE PRODUCTION 35%

WITH A RED PENCIL



Ledloy* feeds faster . . . permits higher speeds . . . increases tool life 40 to 50 per cent . . . vastly improves finish. Actual case histories show that for many automatic screw machine or similar operations, production can be increased 35 to as high as 75 per cent. And in all instances, mechanical properties such as yield strength, tensile strength, ductility and heat treatment are not affected.

Examine your product. Are you specifying the best material? Writing in Ledloy can improve production for you.

Similar advantages are also obtainable through the use of leaded alloy steels which are available in the full range of A.I.S.I. or S.A.E. standard analyses. For assistance or information regarding the application of leaded steel to your products, call our field representative.

ARISTOLOY STEELS

*Inland Ledloy License

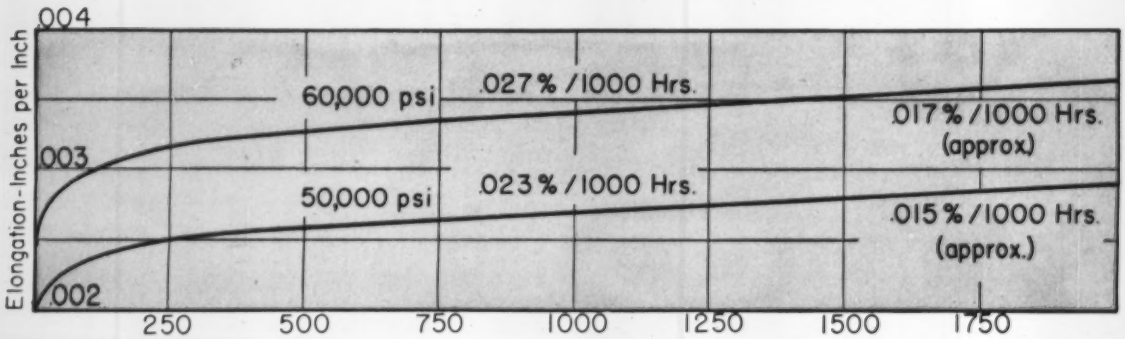
COPPERWELD STEEL COMPANY

WARREN, OHIO

SAVE ALLOYS, GET HIGH ALLOY PERFORMANCE IN GAS TURBINES WITH "17-22-A" (S) STEEL

Contains less than 3% alloy

Gives maximum creep resistance to 1000°F.



Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)

IF your gas turbine parts operate at temperatures not exceeding 1000°F., you can save critical alloys, yet get high alloy performance by using "17-22-A"(S) steel produced by the Timken Company.

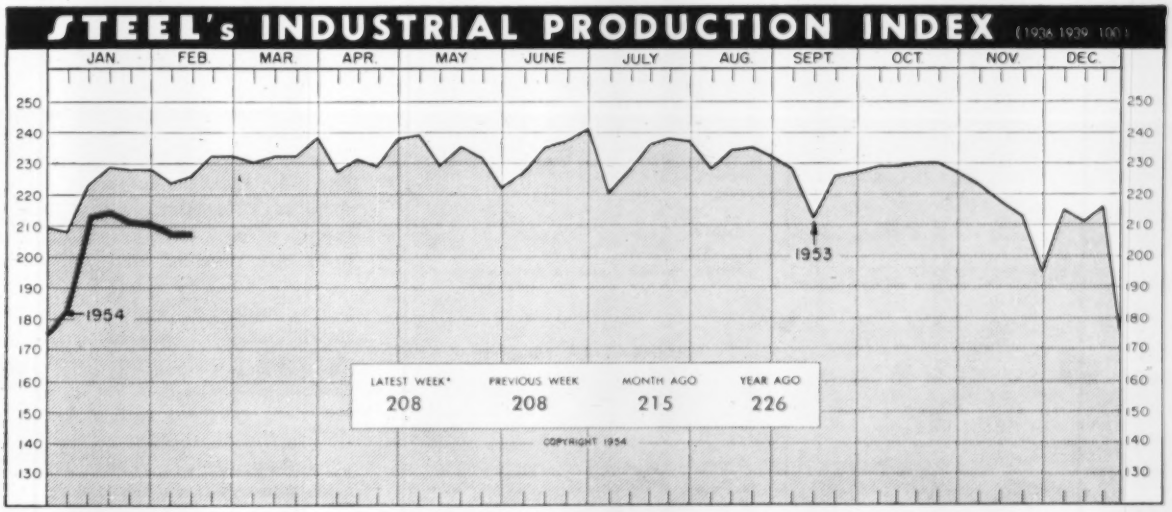
"17-22-A"(S) steel contains less than 3% alloy. It permits you to cut costs. Developed by metallurgists of the Timken Company, "17-22-A"(S) has been used successfully for 10 years in refinery and steam power applications. The graph above shows its creep resistance at 900°F.

"17-22-A"(S) also resists heat checking and thermal cracking. It is readily workable up to 2300°F. It's easy to machine and weld. Maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking.

For complete information on "17-22-A"(S), and its companion analysis, "17-22-A"(V)—used at temperatures up to 1100°F.—write for Technical Bulletin Number 36A. And for help with your high temperature problem, call upon our Technical Staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939=100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
250 240 230 220 210 200 190 180 170 160 150 140 130
1954
1953
LATEST WEEK* 208
PREVIOUS WEEK 208
MONTH AGO 215
YEAR AGO 226
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*Week ended Feb. 13 Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Inventories Resist Efforts To Cut Them

PRODUCTION RETRENCHMENT started by military cutbacks last summer will probably continue until spring, when seasonal factors may cause a rise. During the week ended Feb. 13, STEEL's industrial production index pointed to a preliminary 208 per cent of the 1936-1939 average. The output reflected was 8 per cent less than in the comparable week last year when STEEL's index registered 226.

Inventory Cutback Slight . . .

Total business inventories, on a seasonally adjusted basis, were not cut back until October. In December, the third consecutive month of decline, these stocks totaled $79.8 billion, according to the Office of Business Economics. Inventories at this level were still 4 per cent above December, 1952.

They Borrow Less . . .

Chain reaction effect of present business adjustment is illustrated by the decline in loans to some commercial and industrial groups, Federal Reserve Bank figures reveal. Groups borrowing less in January were: Manufacturers of metal and metal products—for the seventh consecutive month; other manufacturing and mining and the construction industry — for the fifth consecutive month; and the wholesale and retail trades—for the second consecutive month.

Who Are the Unemployed? . . .

A breakdown of employment reductions between mid-December and mid-January has been made by the Bureau of Labor Statistics. It shows a manufacturing drop of 380,000 workers and a wholesale and retail trade slide of 900,000. Downward employment trend is expected to be reversed by manufacturers in the second, third and fourth quarters, according to a survey made by the Purchasing Agents Association of Chicago. Participants believe the employment increase will total 4 per cent —present employment is off 5 per cent from a year ago.

Back to Work Soon . . .

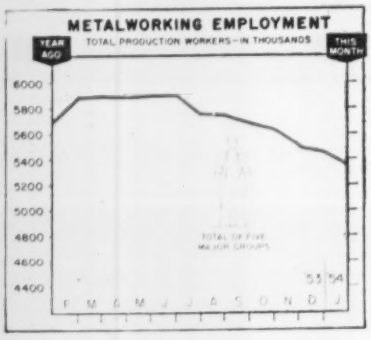
In addition to the unemployed in January there were some 275,000 persons who were on temporary layoff, temporary in that they had definite instructions to return to work within 30 days of the date of layoff, the Bureau of the Census says.

How Much Steel? . . .

Steel production in January continued to decline. A total of 7,960,000 net tons of steel for ingots and castings was produced in January, the American Iron & Steel Institute reports. Output was equal to 111.9 per cent of the 1947-1949 base period but amounted to only 75.4 per cent of present capacity, due to the great expansion made by the steel industry since 1950.

Slow Pace . . .

Reduced demand for stainless and alloy steel is spotlighted by the operating rate of most electric furnace steelmakers. During January, Rotary Electric Steel Co. operated at 55 per cent of capacity, a rate roughly comparable with the current rate of other electric furnace steelmakers, relates M. K. Schnurr, president. Despite the lower rate, Rotary and most other steel producers probably will show a net profit of only slightly less

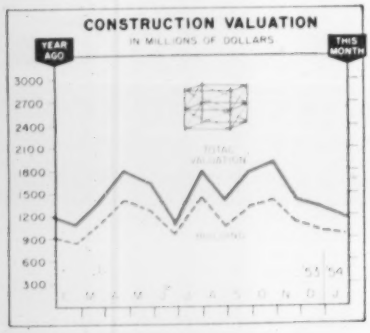


Metalworking Employment

In Thousands

	Production Workers—Five Major Groups				
	Prim.	Fab.	Mach-	Elec.	Trans.
1953	Mtls.	Prod.	inery	Mchy.	Equip.
Jan.	1,188	891	1,289	804	1,484
Feb.	1,142	942	1,323	916	1,543
Mar.	1,145	952	1,335	925	1,574
Apr.	1,144	952	1,321	926	1,576
May	1,138	952	1,307	919	1,556
June	1,143	956	1,300	911	1,548
July	1,134	938	1,264	892	1,533
Aug.	1,131	950	1,236	903	1,523
Sept.	1,117	944	1,228	913	1,493
Oct.	1,099	929	1,219	905	1,479
Nov.	1,078	907	1,207	885	1,414
Dec.	1,065	874	1,207	853	1,452
1954					
Jan.	1,036	875	1,192	821	1,421

U. S. Bureau of Labor Statistics

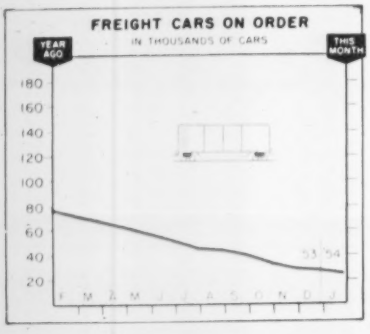


Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1954	1953	1954	1953
Jan.	1,151.9	1,075.9	935.6	876.0
Feb.	.....	1,021.3	.....	792.9
Mar.	.....	1,374.5	.....	1,054.4
Apr.	.....	1,741.5	.....	1,354.2
May	.....	1,606.1	.....	1,219.8
June	.....	1,115.5	.....	922.3
July	.....	1,793.3	.....	1,417.8
Aug.	.....	1,414.4	.....	1,053.4
Sept.	.....	1,741.7	.....	1,290.7
Oct.	.....	1,892.4	.....	1,392.7
Nov.	.....	1,394.1	.....	1,096.0
Dec.	.....	1,279.8	.....	973.8
Total	.....	17,423.5	.....	13,455.0

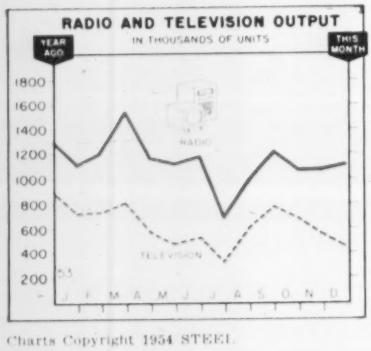
F. W. Dodge Corp.



Freight Car Awards and Backlogs

	Awards		Backlogs	
	1954	1953	1954	1953
Jan.	2,953	5,536	27,959	77,414
Feb.	.....	2,284	.....	71,882
Mar.	.....	3,379	.....	68,553
Apr.	.....	2,432	.....	62,637
May	.....	1,651	.....	57,345
June	.....	1,463	.....	52,315
July	.....	1,632	.....	47,423
Aug.	.....	3,913	.....	45,735
Sept.	.....	3,914	.....	42,198
Oct.	.....	1,705	.....	35,171
Nov.	.....	2,860	.....	31,869
Dec.	.....	2,159	.....	29,950
Total	.....	32,928	.....	

*End of month.
American Railway Car Institute



Radio and Television Output

Thousands of Units

	Radio		Television	
	1953	1952	1953	1952
Jan.	1,093	632	719	405
Feb.	1,192	759	731	409
Mar.	1,549	976	810	511
Apr.	1,159	848	568	323
May	1,109	748	482	309
June	1,164	874	524	361
July	674	442	316	199
Aug.	992	544	604	398
Sept.	1,217	866	770	756
Oct.	1,052	772	680	724
Nov.	1,066	924	560	780
Dec.	1,101	1,325	450	921
Total	13,368	9,711	7,214	6,096

Radio-Electronics-Television Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Dec. 14	Ironers ..... Feb. 15
Employ., Steel	Feb. 1	Machine Tools ... Jan. 8
Fab. Struc. Steel	Dec. 21	Malleable Castings Jan. 18
Foundry Equip.	Jan. 25	Prices, Consumer .. Dec. 7
Furnaces, Indus.	Jan. 8	Prices, Wholesale .. Feb. 1
Gears	Feb. 15	Pumps ..... Nov. 16
Gray Iron Castings	Jan. 18	Ranges, Elec. .... Jan. 8
Indus. Production	Feb. 15	Ranges, Gas ..... Jan. 11
Refrigerators	Jan. 8	
Steel Castings	Jan. 18	
Steel Forgings	Feb. 1	
Steel Shipments	Jan. 11	
Vacuum Cleaners	Jan. 11	
Wages, Metalwk.	Feb. 1	
Washers	Feb. 15	
Water Heaters	Jan. 11	

than a year ago, due primarily to the lower steel scrap price, the lapse of the excess profits tax and a reduction in costs.

Auto Dealers' Plight . . .

Automobile dealers' inventories of new cars soared above the 600,000-unit level for the first time on Jan. 31, *Ward's Automotive Reports* says. Dealers held a 52-day supply of new cars as automobile producers revealed that February car output has been cut 6 per cent below January's. Present trend in the industry is epitomized in the statement, "we will not force new cars on dealers . . . we're determined to gear our rate of production to the capabilities of our dealer organization." That declaration, made by C. K. Whittaker, vice president in charge of sales, Studebaker Corp., was followed by this one: "The company's job is to help its dealers get the proper sales material and show them how they are to be trained."

Slow Burn for Coal . . .

Industrial stocks of bituminous coal are increasing at a time when production is decreasing. Stocks on Jan. 1 totaled 79 million tons, compared to 75 million tons on Jan. 1, 1953, the National Association of Purchasing Agents estimates. Fifty per cent of these stocks are in the hands of electric utilities. Production of bituminous coal from Jan. 1 to Jan. 30 totaled 33,413,000 tons, against 39,275,000 tons in the like month a year ago, the National Coal Association reports.

Railroad Revenue Slides . . .

Net income of the nation's railroads in December, $74 million, represented a slide for the fourth consecutive month, the Association of American Railroads points out. Income was $44 million below the corresponding month in 1952. Backlog of orders for freight cars amounted to 27,959 units in January, the seventeeth consecutive month of decline. The downtrend continued in January and the deliveries of new freight cars fell by almost 40 per cent below the like month in 1953. Looking at the number of new orders ahead for

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,764	1,774	2,248
Electric Power Distributed (million kwhr)	8,684	8,674	8,147
Bitum. Coal Output (daily av.—1000 tons)	1,307	1,396	1,428
Petroleum Production (daily av.—1000 bbls)	6,300[1]	6,271	6,545
Construction Volume (ENR—millions)	$196.9	$194.3	$288.5
Automobile, Truck Output (Ward's—units)	140,616	138,987	147,103
TRADE			
Fre.ght Car Loadings (unit—1000 cars)	626[1]	624	682
Business Failures (Dun & Bradstreet, no.)	277	238	200
Currency in Circulation (millions)[3]	$29,923	$29,930	$29,776
Dept. Store Sales (changes from year ago)[3]	−1%	−1%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,807	$20,408	$15,495
Federal Gross Debt (billions)	$274.8	$274.8	$267.4
Bond Volume, NYSE (millions)	$21.7	$20.9	$11.4
Stocks Sales, NYSE (thousands of shares)	9,441	8,936	5,718
Loans and Investments (billions)[4]	$80.7	$80.1	$77.0
U. S. Gov't Obligations Held (billions)[4]	$33.0	$33.3	$31.4
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	203.2	203.3	210.7
All Commodities[7]	110.5	110.6	109.6
Commodities Other Than Farm & Foods[7]	114.4	114.5	113.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

the industry this year, W. F. Wilmas, executive vice president, Pressed Steel Car Co., doubts that it will be more than 25,000 to 30,000.

How Construction Looks . . .

The construction industry presents a curious picture for January. During that month the amount of new construction put in place totaled $2.4 billion, the Department of Commerce reports. Expenditures at this level were 9 per cent below December yet were 3 per cent above the previous January. Also the total of building and engineering contracts awarded in the 37 states east of the Rockies, $1,151,987,000, was an all-time high for any year's opening month, according to F. W. Dodge Corp. All categories, including heavy engineering, increased over the comparable month last year. Yet, *Engineering News-Record's* compilation of all heavy construction awards for January fell off to $766 million, well below a year ago and the smallest volume for the month since January, 1949.

Separating the Boys . . .

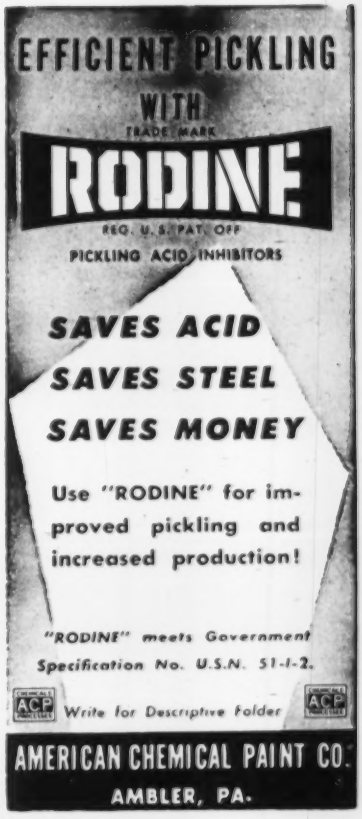
In looking at the construction industry's near future, H. C. Turner Jr., president, Turner Construction Co., believes it not unlikely that during the next few years we shall see a large increase in the industry's business failures. This will occur when the financially weak and less experienced contractors fall by the wayside because of unprofitable operations, a situation that could well reduce the volume of earnings of all contractors for a while.

Gas Always Rises . . .

Like the electric industry, the gas industry has a habit of breaking records. Gas sales of 5,600,000,000 therms to ultimate consumers in December were the highest for the month on record, the American Gas Association reports. December's sales were topped only by last January's, when nearly 5,900,000,000 therms were consumed. An industrial sales gain of 11 per cent over the comparable month in 1952 was responsible for the immense volume.

Trends Fore and Aft . . .

The do-it-yourself trend caused sales in January of hammers and saws and pots and pans to increase fractionally over the record high of December 1952, says the National Retail Hardware Association.



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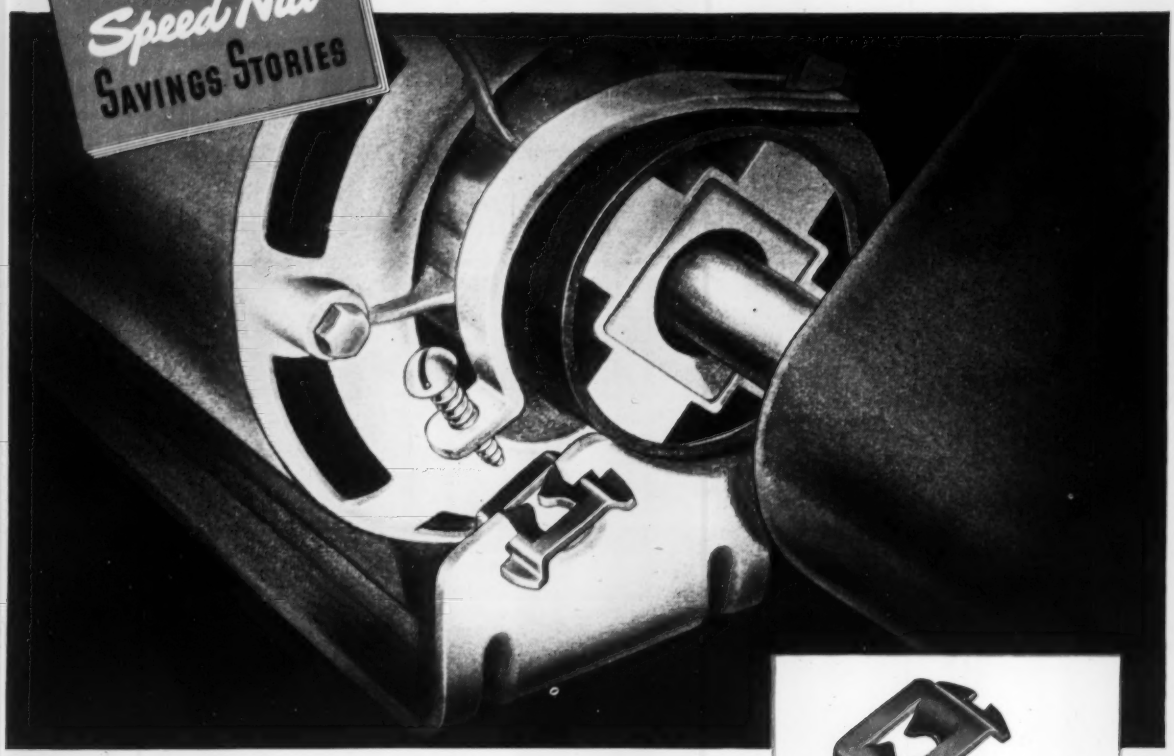


"EASY does it" with SPEED NUTS®

...cuts assembly time 87%!

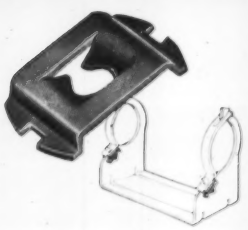
Easy Spindrier

What was causing delays in the production of the new Easy Spindrier? Easy engineers recently found out in a hurry. It was the motor mount bracket assembly. A staking operation was creating a decided bottleneck.

Borrowing on their own long-time experience with SPEED NUT brand fasteners—and the help of the Tinnerman field engineer—they hit on a highly successful solution using a special Flat-Type SPEED NUT!

Proof of the success was supplied through a startling 87% saving in production time—and an overall cost savings of 47%!

Little wonder, then, that Easy engineers saw to it that over 60 SPEED NUTS were designed into the new Easy Automatic Washers.



Special self-retaining Flat-Type SPEED NUT snaps easily into existing notch in bracket. Replaces round nut which was staked down, often causing distortion of nut—this meant re-tapping. Also, paint clogged around nut, causing screws to bind. Paint can't clog SPEED NUTS.

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TINNERMAN Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES

C. P. MAYER
. . . Mesta Machine roll sales mgr.

C. P. Mayer was made manager of roll sales at **Mesta Machine Co.**, Pittsburgh. He has been with Mesta for the last 11 years.

G. S. Massa, for many years vice president in charge of manufacturing at Hydro-Aire Inc., joined **Com-Air Products Inc.,** Los Angeles, as vice president.

Lebanon Steel Foundry, Lebanon, Pa., appointed **Harold C. Templeton** chief metallurgist, **Ray W. Patridge** service manager and **Roy W. Daub** chief planning engineer.

Carl W. Dietrich Jr., assistant to the director of purchases and assistant purchasing agent of Thor Corp., was transferred to its subsidiary, **Phillips Control Corp.,** Joilet, Ill., as assistant to the president and chief purchasing agent.

J. R. Spence was appointed vice president of **Victor Equipment Co.'s** alloy rod and metal division, Los Angeles. He has been manager of the division for several years.

Belmont Iron Works, Philadelphia, elected **John A. Mitchell** board chairman, **Albert W. Schede** president and **S. Lowrie Floyd** treasurer.

Charles M. Conklin is manager of irrigation pipe sales, **Aluminum Co. of America,** Pittsburgh.

THOMAS H. BRUMAGIN
. . . Ajax Flexible chief engineer

Thomas H. Brumagin was made chief engineer of **Ajax Flexible Coupling Co. Inc.,** Westfield, N. Y. He has been associated with the engineering department for seven years.

Matthew J. Hall, formerly chairman of the finance committee, was elected president of **Continental Copper & Steel Industries Inc.,** New York. He succeeds **Ernest G. Jarvis,** now chairman of the board. **Mortimer S. Gordon,** general counsel and former chairman of the operating committee, was elected chairman of the managing committee.

Dravo Corp., Pittsburgh, appointed **D. R. Berg** manager of its piping department, **W. L. Davidson** manager of its heating department and **E. N. Hower** assistant manager, apparatus department. **T. L. Hartman Sr.** was assigned to special development work in connection with certain new processes and products.

George F. Powell, manager of government sales for Rockwell Mfg. Co.'s, **Delta Power Tool Division** for the last two years, was named Pittsburgh district sales manager.

Karl F. Landegger, president of Parsons & Whittemore Inc., was elected vice chairman of **Black-Clawson Co.,** Hamilton, O.

FRANCIS WEISS
. . . heads new dept. of Alliance Machine

Francis Weiss was appointed director of the newly created development department of **Alliance Machine Co.,** Alliance, O. He has been associated with the Steelton plant of Bethlehem Steel Co. for 14 years.

H. G. Trotter was made assistant to the executive vice president and general manager of **Morse Twist Drill & Machine Co.,** New Bedford, Mass. **William Descault** was made works manager, assuming charge of manufacturing operations.

Bruce J. Briggs was promoted to field sales manager, tool division, **Barcalo Mfg. Co.,** Buffalo. He was assistant tool sales manager.

Charles E. Finn, former manager of the Chicago midwestern sales office of Berry Division, Oliver Iron & Steel Corp., joined **Double A Products Co.,** Manchester, Mich., in its engineering department as assistant to the vice president in charge of the hydraulic division.

James R. Ireland, staff assistant to the vice president-research and engineering, was made assistant director of research at **Indiana Steel Products Co.,** Valparaiso, Ind. **James G. Richmond** was named assistant manager, manufacturing division.

Phelps Walker was made works

A. B. DRASTRUP

J. F. BYERS JR.

B. M. BYERS

. . . A. M. Byers Co. elects executive vice president and two v. p.s

manager of the Janesville and Menomonie, Wis., plants of **Parker Pen Co.**

A. B. Drastrup was elected executive vice president, **A. M. Byers Co.**, Pittsburgh. He was made manager of steel sales in 1946 and three years ago was also named assistant to the president. **J. F. Byers Jr.** and **B. M. Byers** were elected vice presidents. The former has been assistant to the president since 1949. B. M. Byers, for the last year general manager of wrought iron sales, is now sales vice president.

Following purchase of the entire stock of **Sutter Products Co.**, Detroit, and retirement of **Percy L. Sutter**, vice president, Ray H. Sutter, president, announces the following personnel changes: **Russell F. LaBeau**, since 1950 vice president and chief engineer, is now executive vice president in charge of all company operations. **George Buchanan** is vice president-sales and sales promotion in co-operation with the company's U. S. sales representative, Frederic B. Stevens Inc. **Earl J. Blough** is chief engineer, **Oscar Bernth** plant manager, **J. A. Martineau** general purchasing agent, **Seymour L. Collins** manager of material control and customer service and **Mrs. H. M. Johnson** office manager.

RUSSELL F. LaBEAU

GEORGE BUCHANAN

. . . appointments at Sutter Products Co.

Roy E. Heffner was named a district sales manager for **DeWalt Inc.**, subsidiary of American Machine & Foundry Co., Lancaster, Pa. His territory includes Maine, New Hampshire, Vermont, Rhode Island and Massachuseets.

L. N. Aikman joined the executive staff of **Dumont Aviation Associates**, Long Beach, Calif., as sales promotion manager.

Joseph Abdo, former supervisor of automatic controls system, was named chief engineer of all divisions at **Drayer-Hanson Inc.**, Los Angeles.

Eugene J. LaPorte, Cleco Division salesman, Reed Roller Bit Co., was made assistant to the sales division manager in Cleco's Chicago office.

Electro Dynamic Division, **General Dynamics Corp.**, Bayonne, N. J., named **Mark L. Lane** New York district manager.

Norman E. Bateson was appointed associate director of **Pullman-Standard Car Mfg. Co.'s** research and development division at Hammond, Ind. He was with the engineering design division.

Roy J. Dunham, formerly with Heatbath Corp. as Michigan district manager, joined **J. E. Bullock Co.**, Detroit.

P. S. Tseu joined **Pastushin Aviation Corp.**, Los Angeles, as pre-

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JAMES M. ADAIR
. . . sales mgr., Hoover electric motors

MARION C. WILSON
. . . Calumet Steel design engineer

DANIEL J. COCKRELL
. . . Magnetic Engineering sales mgr.

liminary design aerodynamicist. He had served in the same position with Lockheed Aircraft Corp.

James M. Adair was made sales manager of **Hoover Co.'s** electric motor division in North Plainfield, N. J. He has 25 years' experience in the motor industry, acquired in positions with Westinghouse Electric Corp. and Star-Kimble Motor Division, Miehle Printing Press & Mfg. Co.

Robert J. Johnson, former chief metallurgist at Round Chain Cos., joined the Pittsburgh technical section of **International Nickel Co. Inc.'s** development and research division.

Arthur C. Nickel was named manager of hospital equipment sales of **Maysteel Products Inc.,** Milwaukee. He formerly was general sales manager of Milwaukee Stamping Co.

Norbert A. Weiss and **Charles W. Hunter** were promoted to executive posts at General Motors Corp.'s Brown-Lipe-Chapin Division's Syracuse, N. Y., plant. Mr. Weiss is factory manager and Mr. Hunter is plant superintendent.

Bristol Co., Waterbury, Conn., appointed **John G. Fleming** to the newly created position of product planning manager.

A. J. DeFino, general manager, **Fedders-Quigan Corp.,** Buffalo, was elected vice president of the company.

Marion C. Wilson, as chief design engineer at **Calumet Steel Castings Corp.,** Hammond, Ind., will be responsible to its sales department for consulation with users of steel castings. He is in charge of product development and improvement.

Edgewater Steel Co., Pittsburgh, appointed **Robert C. Carrick** service engineer with headquarters at the firm's main office in Oakmont, Pa. He formerly was with National Aluminate Corp.

Industrial Brownhoist Corp., Bay City, Mich., engaged the services of **Louis T. M. Ralston** as engineering consultant to management.

W. B. Sander was elected president of **Extruders Inc.,** Hawthorne, Calif. He replaces **William S. Towne,** now chairman of the board.

At **National Presto Industries Inc.,** Eau Claire, Wis., **Sam Halpern** was named vice president-contract division and **Philip Breitman** vice president in charge of purchasing and planning.

Acme Steel Products Division, Acme Steel Co., Chicago, appointed **Albert G. Karstens** national account supervisor and **Theron P. Schulz** special representative for the company's central sales area.

Karl F. Long was appointed chief engineer, **International Railway Car Co.,** Buffalo. **A. C. Gesegnet** was made superintendent of International's Buffalo operations.

Daniel J. Cockrell was appointed sales manager, **Magnetic Engineering & Mfg. Co.,** Clifton, N. J. He joined the firm in 1951 as assistant sales manager and was appointed export manager in 1952, a position he still holds.

William W. Fisher was elected vice president in charge of operations and **Robert A. Tobias** vice president in charge of sales at **American Type Founders Inc.,** Elizabeth, N. J.

Collin F. Stevens joined the Buffalo office sales staff of **Frederic B. Stevens Inc.,** to represent its metal finishing sales division.

J. T. Riday was appointed manager of **Cutler-Hammer Inc.'s** South Bend, Ind., branch sales office to succeed the late **Terry Fisher.**

C. W. Greaves was appointed special assistant to the manager of **Consolidated Vultee Aircraft Corp.'s** San Diego, Calif., division.

L. A. Shaw was made manager of the Rocky Mount, N. C., branch of **Graybar Electric Co.**

Legler Paxton was appointed western regional sales manager for the automotive division of **Clayton Mfg. Co.,** El Monte, Calif.

James S. Milliken was made sales engineer in the South and Southwest for the engineering works

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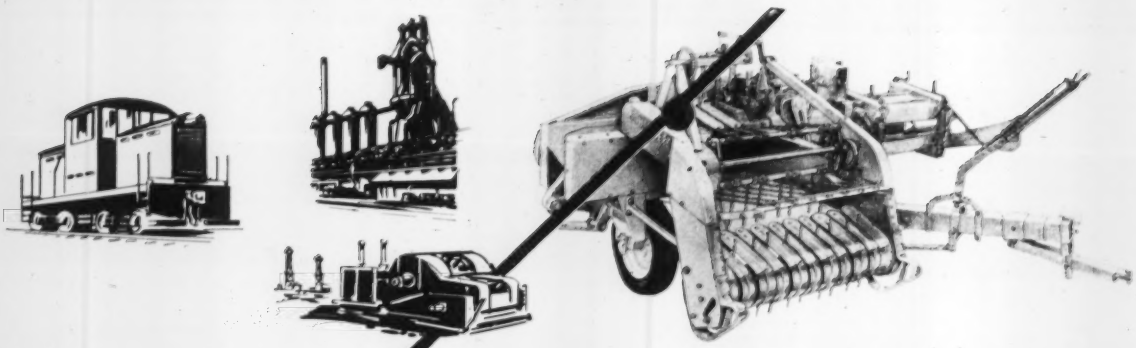
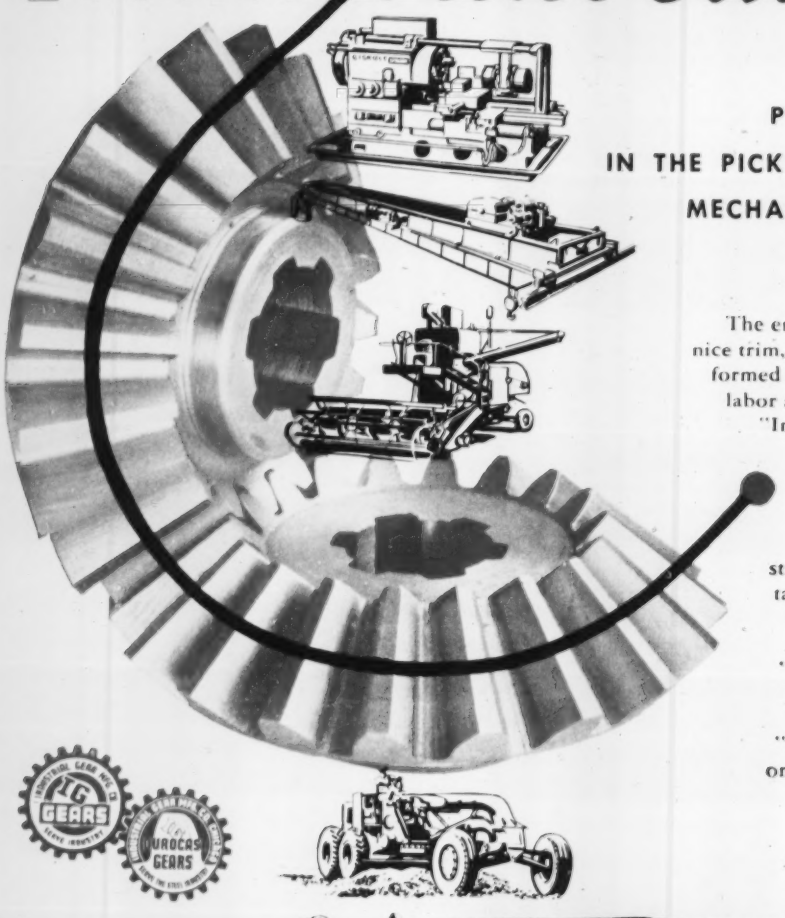
CLAYMONT, DELAWARE

CF&I



Industrial Cut Gears

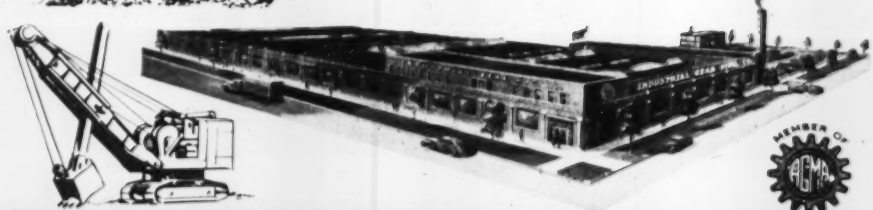


PLAY AN IMPORTANT ROLE IN THE PICKUP, FEED AND WIRE-TYING MECHANISMS OF JOHN DEERE AUTOMATIC HAY BALERS

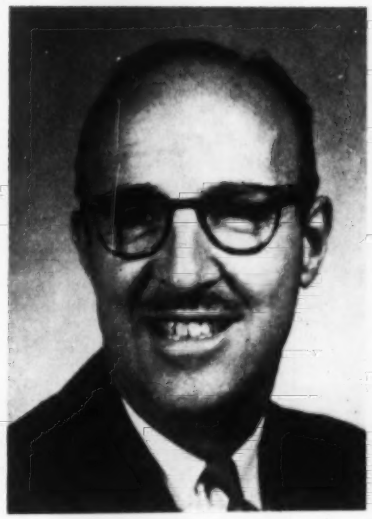
The end result of John Deere Hay Balers is a nice trim, leafier and more nutritious bale of hay formed speedily and compactly with minimum labor and power. Among its components are "Industrial Cut Bevel Gears" which make this essential implement of farming function smoothly and efficiently.

"Industrial Cut Gears" are important adjuncts in hundreds of mobile and stationary pieces of equipment. They are tailored to fit each application perfectly, hence assure long, dependable service with minimum maintenance cost. "Industrial Cut Gears" will prove to be the economical answer to your drive problems too! It will pay you to write "IG-Durocase" (Steel Mill Type Gears) or "IG-General Service Gears" into your specifications. They'll fulfill your every expectation.

Our modern plant grew to large proportions because of the service we render . . . and because gear and sprocket cutting is our bread and butter—not a sideline. Write for Bulletin No. 152-A and see how well equipped we are to handle your needs.



Industrial Gear Mfg. Co. 4545 W. VAN BUREN ST. CHICAGO 24, ILLINOIS



DONALD L. PRICE
. . . Norton abrasive sales mgr.

ALVIN L. KRIEG
. . . PR director for U. S. Steel district

WILLIAM ADAM JR.
. . . heads Ajax Electric Co.

division. **Dravo Corp.**, Pittsburgh.

Norton Co., Worcester, Mass., appointed **Donald L. Price** sales manager, abrasive division; **Fred L. Curtis** assistant sales manager, abrasive division; and **Bruno D. Hendrickson** abrasive engineer in charge of the western New York territory. Mr. Hendrickson replaces **Edward J. Lalor** who resigned Feb. 1 to become a member of Oliver Abrasive & Tool Co. Inc., a Norton distributor.

Charles D. Michaelson was elected vice president of Kennecott Copper Co.'s subsidiary, **Braden Copper Co.**, Santiago, Chile.

Kenneth Slawson was appointed assistant to the president of **Ford Instrument Co.**, division of Sperry Corp., Long Island City, N. Y. **Robert Armstrong** joined the quality control division as assistant to the director, **C. E. Ellis.** Mr Slawson was manager of E. G. Staude Mfg. Division, recently sold. Mr. Armstrong formerly served Electrol Inc. as quality manager.

Alvin L. Krieg was appointed director of public relations for **United States Steel Corp.** in the Utah-Intermountain district with headquarters in Salt Lake City. Assistant director of public relations for the corporation in the Cleveland district since 1949, Mr. Krieg now succeeds **Paul Sullivan**, who was recently made director of public relations for U. S. Steel in the Chicago district.

Victor C. Studley was appointed assistant to the president of **Bucyrus-Erie Co.**, Milwaukee.

Clifford G. Strote was made director of purchases for all divisions and subsidiaries of **American Chain & Cable Co. Inc.**, Bridgeport, Conn. **M. C. Ness** was made assistant director of purchases. **A. C. Curran** has resigned.

John D. Woollett was made manager of **Trailmobile Inc.'s** factory branch in Youngstown.

Francis H. Gerlach was made manager of engineering for **Lamb Electric Co.**, Kent, O.

Ajax Electric Co., Philadelphia, elected **William Adam Jr.** president to succeed **Dr. G. H. Clamer**, retired. **John E. Haig** and **Leon B. Rosseau** were elected vice presidents. Dr. Clamer continues as president of Ajax Electro Metallurgical Corp., Ajax Electrothermic Corp. and the Ajax Engineering Corp.

Richard A. Burkett, formerly of Beryllium Corp., now represents **Penn Precision Products Inc.** in the Chicago area.

Herman L. Eberts was elected president and general manager, **Fleet Mfg. Co. Ltd.**, Ft. Erie, Ont., to succeed **Daniel Robertson**, now chairman of the board. Mr. Roberts joined Fleet as managing director in 1952. **Thomas R. Harrison** was elected vice president.

Frans Wethly succeeds **David M. Griffith**, retired, as executive vice president, **Wilputte Coke Oven Division**, Allied Chemical & Dye Corp., New York. Mr. Griffith continues as a consultant.

OBITUARIES...

Frank E. Moore, 76, founder and chairman of **Mathews Conveyer Co.** Ellwood City, Pa., died Feb. 6.

Matthew G. Kauffmann, 61, president, **Genesee Welding Works Inc.**, Rochester, N. Y., died Feb. 4.

George F. Hessler, 64, vice president-sales and a director and member of the executive committee of **Craybar Electric Co.**, New York, died in Florida Feb. 1.

Graham B. Haring, 57, Cleveland-area representative for **Revere Copper & Brass Co.**, died Feb. 7.

Frederick M. Washburn, 59, assistant general superintendent, **Wisconsin Steel Works**, International Harvester Co., Chicago, died Feb. 8.

David H. Miller, 69, president, **Gilbert & Bennett Mfg. Co.**, Georgetown, Conn., died Feb. 8.

Harry G. Chapin, president, **Vande Veer & Coleman Inc.**, Lyons, N. Y., died Feb. 7.

Lobdell Broadens Lines

Begins manufacture of Bridgeport and Diamond lines of grinder and cutoff machines

LOBDELL UNITED CO., Wilmington, Del., acquired the engineering, patterns, tooling and all rights to the manufacture and sale of the Bridgeport and Diamond lines of grinder and abrasive cutoff machines.

These lines were manufactured formerly by Bridgeport Safety Emery Wheel Co. and Diamond Machine Co., Bridgeport, Conn., and by Columbia Division of Lodge & Shipley Co., Cincinnati, from whom Lobdell United purchased them on Dec. 31, 1953. Lobdell United Co. is a wholly owned subsidiary of United Engineering & Foundry Co., Pittsburgh.

Grinders—Knife grinders, vertical and horizontal facing grinders and a number of special purpose grinders make up the grinding line. Abrasive cutoff saws of manual, semiautomatic and fully automatic types in a number of sizes make up the saw line.

The Bridgeport and Diamond lines of grinders complement Lobdell's roll grinders. The firm also makes a cold-cutting friction saw for cutting large shapes and bars; the new line of abrasive cutoff machines will cover the smaller sizes of shapes and bars.

Manufacture of replacement parts for machines has begun. Lobdell also is beginning the manufacture of new machines. These lines, new to Lobdell, will have their own staff of experienced people to give prompt service and engineering advice. It is planned to promote these machines through key machine tool distributors who will be able to expand Lobdell service to its customers in the metalworking, refractory and many other branches of industry.

Wolverine Tube Moves Branches

Calumet & Hecla Inc.'s Wolverine Tube Division, Detroit, moved its branch office to the Liberty Trust Bldg., Broad and Arch streets, Philadelphia 7. The new offices are the sales headquarters for Phil MacKay and John VanWagoner. G. H. Tobelman, eastern district sales manager, maintains his headquarters in New York.

Wolverine Tube moved its St. Louis office to 25 S. Bemiston Ave. where T. F. Vigmostad will have his headquarters. The division also opened an office at 4050 Broadway, Kansas City, Mo., with Thomas E. Goodyear in charge. The midwestern district sales manager is E. J. Campbell, Chicago.

Reynolds Metals Names Agent

Reynolds Metals Co., Louisville, appointed Turner Metal Supply Co., Huntington Park, Calif., as a distributor of its aluminum wire, rod and bar products.

Establishes Regional Office

AC Spark Plug Division, General Motors Corp., Detroit, established a regional sales office at 1422 Euclid Ave., Cleveland. George U. Matthews is regional manager at Cleveland; Paul P. Trainor, at New York.

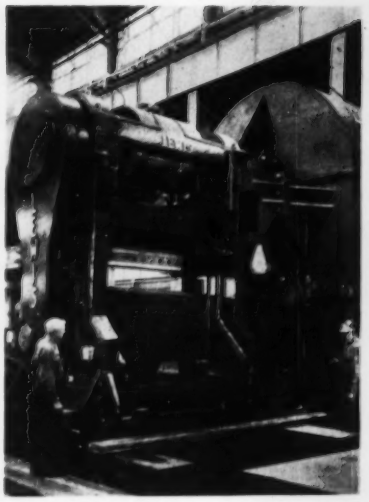
Beckman Opens Munich Plant

Beckman Instruments Inc., Los Angeles, established a subsidiary in Munich, Germany, to manufacture spectrophotometers and pH meters, according to Arnold O. Beckman, president.

Galvanizing Firm Expands

Hanlon Gregory Galvanizing Co., Pittsburgh, completed an expansion program in which expenditures for construction and property exceeded $330,000. Hanlon Gregory and Tri-Lok Co., an affiliate, bought the adjoining plants of H. K. Porter Co. and Collins & Wright Co. as well as the right-of-way on Berlin street which runs between the two plants. Part of the H. K. Porter buildings was razed to provide the site for an additional galvanizing plant which increases the firm's capacity by 25 per cent. The addition enables the company to galvanize larger fabrications. The installations comprise a degreasing tank; five wooden tanks for pickling, rinsing and prefluxing preparatory to galvanizing; and a galvanizing kettle which is 16 ft long, 4½ ft wide and 5½ ft deep.

An additional function of the new facilities is to free the main plant with its 35-ft long by 7-ft deep galvanizing kettles for the galvanizing of long material.



Clairton Gets New Shear

Blaw-Knox Co.'s Lewis Machinery Division, Pittsburgh, shipped a hot slab shear, shown above on the assembly floor, to United States Steel Corp.'s Clairton Works, Clairton, Pa. On the 40-in. silicon slab line, it will cut slabs up to 7 in. thick and will have a running speed of 12 cuts per minute

Sims Pump Valve Names Agent

Sims Pump Valve Co., Hoboken, N. J., named Nutmeg Industrial Supplies Inc., New Haven, Conn., as distributor of its products in Connecticut.

St. Pierre Buys Trimont Mfg.

St. Pierre Chain Corp., Worcester, Mass., drop forge producer, purchased Trimont Mfg. Co., Roxbury, Mass., and will operate it as the Trimo Wrench Division.

Plans $1-Million Plant

Gould-National Batteries Inc., Trenton, N. J., will build a $1-million automotive storage battery plant in Antioch, Calif. Production is scheduled to start "sometime after mid-1954." It will have a capacity of 300,000 automotive batteries a year, plus a certain

Vanadium-Alloys

announces

a new FM series

FREE MACHINING

of free-machining steels*

in the following important tool steel grades

HIGH SPEED STEELS

RED CUT SUPERIOR FM
VASCO SUPREME FM
NEATRO FM
VASCO M2 FM
8N2 FM
VAN-LOM FM

DIE STEELS

OHIO DIE FM

CROCAR FM

SPEED CUT

For tool steel applications where *free machining* quality is desirable, we offer this new FM Series. Vanadium-Alloys FM steels machine more easily, permit better machined finish, and in certain instances show improved performance. To obtain free machining characteristics in the nationally-known steels listed above, simply specify the brand name desired, followed by the letters FM.

Complete information on our FM steels is available from your Vanadium-Alloys representative. Ask him for the facts.

*Several grades manufactured under U.S. Patent No. 2,204,283, Simonds Saw and Steel Co.

Vanadium-Alloys
STEEL COMPANY
LATROBE, PA.

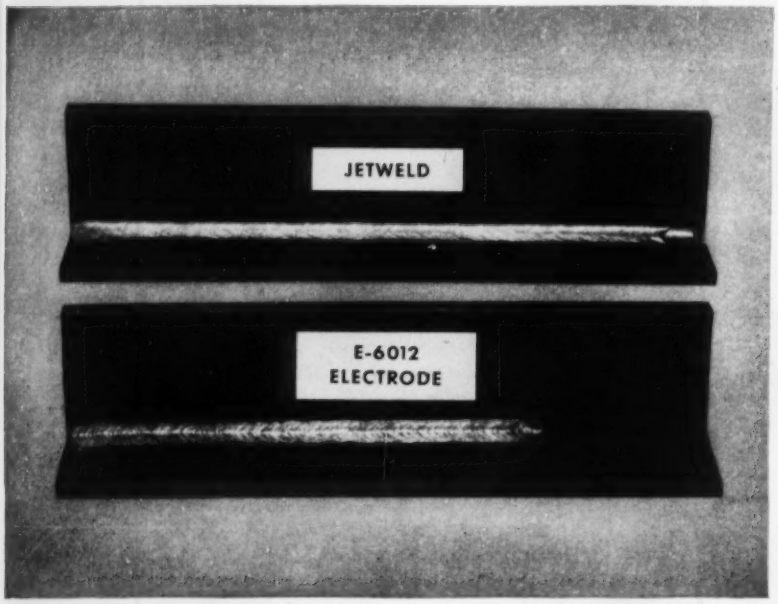
COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

IT TAKES SPEED

to *really* cut welding costs

HERE ARE THE FACTS! 86¢ out of every welding dollar goes for labor and overhead. Obviously, the most effective way to cut welding costs is to boost welding speeds. This is exactly what you accomplish by using the *right* Lincoln electrode for your welding job. Each Lincoln electrode is designed to do a *specific type of job* . . . do it faster because Lincoln has higher *useable* melt-off rates to give more footage than possible with other makes. This actual test proves the *extra speed* you get with Lincoln electrodes.

TEST OBJECTIVE: To compare the welding speed of Jetweld with the best other make E-6012 electrode in horizontal fillets.



	LINCOLN JETWELD	THE FASTEST E-6012 ELECTRODE
PLATE SIZE	3/8"	3/8"
FILLET SIZE GAUGE	1/4"	1/4"
ELECTRODE SIZE	5/16"	1/4"
CURRENT AMPS.	275 AC	350 AC
ARC SPEED INCHES PER MINUTE	15.0	11.0
DEPOSITION RATE—POUNDS PER MINUTE	.140	.135

LINCOLN JETWELD IS 36% *FASTER* IN THIS SPECIFIC APPLICATION

INVESTIGATE WHICH COST-CUTTING COMBINATION OF THESE LINCOLN ELECTRODES IS BEST FOR YOU

- For flat and horizontal fillets — high-speed, self-cleaning, submerged-arc-like appearance . . . *JETWELD.*
- For welds having poor fit-up. All positions—E-6012 . . . *FLEETWELD 7.*
- Soft arc action, easy-cleaning welds. All positions —E-6013 . . . *FLEETWELD 47.*
- High-speed production welding of lap and fillet welds. E-6012 . . . *FLEETWELD 72.*
- For deep penetration, structural and pipe welding butt and fillet welds in flat, vertical, and overhead positions . . . *FLEETWELD 5.*

GET THE FACTS. ***Speeds and procedures for mild steel electrodes are in Bulletin 462, available by writing on your letterhead.***

THE LINCOLN ELECTRIC COMPANY
DEPT. 1601 CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

number of industrial storage batteries. Construction has started on an auto battery plant in Houston.

National Iron Expands Plant

National Iron Corp. Ltd., Toronto, Ont., is erecting a factory extension to step up the production of cast-iron pipe fittings. A mechanical foundry process will replace the present hand-mold casting method. The $400,000 addition will raise total plant floor space to over 100,000 sq ft.

Equipment Firm Names Agent

Sintering Machinery Corp., Netcong, N. J., appointed Lee Redman Equipment Co., Phoenix, Ariz., as sales representative for its line of continuous weighing and feed regulating equipment.

Rapids-Standard Buys Firm

Purchase of an interest in Keystone Conveyor Co., Detroit, was announced by J. R. Sebastian, president of Rapids-Standard Co. Inc., Grand Rapids, Mich. Keystone manufactures endless chain conveyors, while Rapids-Standard makes gravity and power belt conveyors, hand trucks, industrial casters, and other conveying equipment. Name of the Detroit firm was changed to Rapistan-Keystone Inc. with William Beveridge continuing as president and general manager.

Harvey Vogel Mfg. Co. Moves

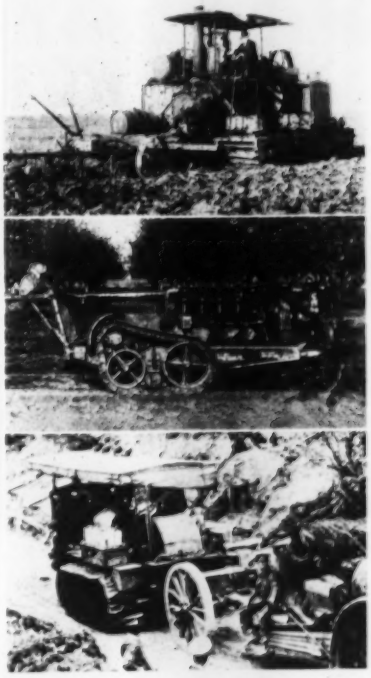
Harvey Vogel Mfg. Co., formerly located at 1000 Raymond Ave., St. Paul, moved to larger quarters at Como avenue and the Minneapolis city limits after remodeling the building formerly occupied by American Farm Machinery Co. The company's specialty is fabricating metal stampings of every conceivable type, using temporary and semipermanent dies.

Vitro Opens Washington Office

Vitro Corp. of America, New York, opened an office at 726 Jackson Pl. N.W., Washington 6. The office is occupied by E. G. Littel, assistant to the president, and C. J. Roggi, foreign projects representative. Vitro's operating divisions are Vitro Mfg. Co., maker of ceramic colors and chemical products; Vitro Uranium Co., ore processor; Vitro Rare Metals Co., refiner; Vitro Engineering Division, designer of processing and manufacturing facilities; Vitro Laboratories, Silver Spring, Md., which is engaged in research and development.

Will Co-ordinate Export Sales

Westinghouse Air Brake Co., Wilmerding, Pa., organized Westinghouse Air Brake International Co., New York, to expand its product line overseas. President of the new company is George P. Gregory Jr., New York exporter.



Fifty Years on Tracks

After 50 years of track-type tractor manufacturing, Caterpillar Tractor Co., Peoria, Ill., takes a look at the past with these old photographs. Top, a track-laying conversion from a steam tractor developed by Holt Mfg. Co., a Caterpillar parent company, in 1904. Middle, a gasoline powered "humpbacked" tractor manufactured in 1915 by Best Mfg. Co., another Caterpillar parent company. Bottom, a Holt artillery tractor of World War I, one of the first full crawler types. Hold Mfg. Co. and Best Mfg. Co. merged to form Caterpillar Tractor Co. in 1925

Diamond Alkali Forms Units

Diamond Alkali Co., Cleveland, established a Chlorinated Products Division and a Plastics Division. Each of the divisions will operate autonomously, assuming all sales, research and plant manufacturing responsibilities under the direction of division general managers. A. L. Geisinger, vice president, is general manager of the Plastics Division. The former Plastics & Agricultural Chemicals Division is abolished. C. E. Lyon, vice president, is general manager of the Chlorinated Products Division.

Burg Tool Opens Branch

Burg Tool Mfg. Co., Los Angeles, opened an office at 5329 Lincoln Ave., Chicago, under the name of Midwestern Burgmaster Machinery Co. R. A. Gorman is manager.

Acme Abrasive Names Agent

Acme Abrasive Co., Center Line, Mich., appointed T. A. Reilly Co., Chicago, as its representative in that territory. Acme specializes in grinding wheels for the steel, foundry, forging and other heavy industries.

Will Operate Cobalt Refinery

Chemical Construction Corp., a subsidiary of American Cyanamid Co., New York, will manage and operate for two years the cobalt refining plant at Garfield, Utah, which is owned by Calera Mining Co., a subsidiary of Howe Sound Co., New York. The plant has been in production on a partial scale since late 1952. The object of the new contract is to enable Chemical Construction Corp., which designed and constructed the plant, to place the operation on a successful commercial basis.

The cobalt concentrate will be supplied by Calera from its mill at the Blackbird mine in Idaho and will be processed by Chemico for Calera on a toll basis.

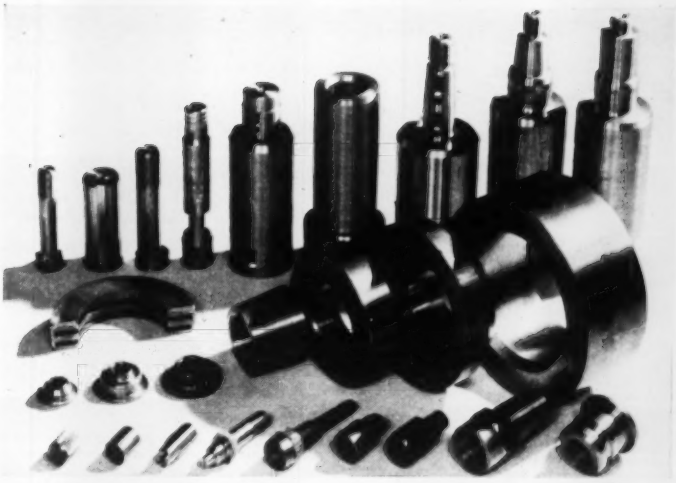
The plant embodies Chemico's

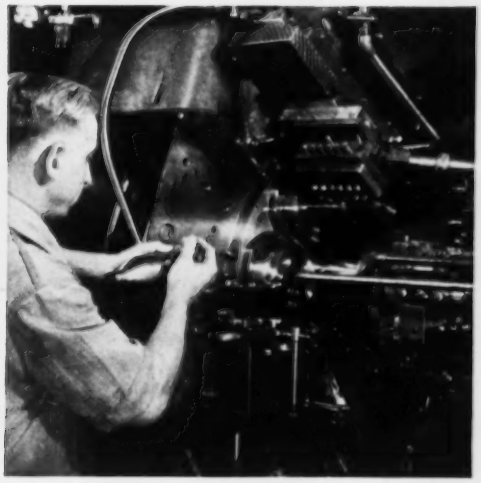
(*Please Turn to Page 86*)

MACHINABILITY
LIKE THIS

6 HELPFUL MANUALS

filled with how-to-do-it information and data to help you use Republic Union Cold Drawn Steels. Write for "Union Drawn Pocket Library."





can cut your unit costs

Here's a suggestion:

Take any one of the parts shown above — any steel part, for that matter. Make it out of ordinary cold drawn steel. List your unit costs.

Then make the same part out of Republic Union Cold Drawn Steel. Like many others, you may find that the uniformly high machinability of Republic Cold Drawn Steels can help your unit costs look their best.

We have the facts to prove it. Not only from our customers, but right in our own plant where we pre-test this machinability on our own "automatics."

And to help you get the most in machinability from Republic Cold Drawn Steel, we will be glad to send one of our metallurgists or machining engineers. He will visit your plant, swap ideas on speeds and feeds with your plant men and engineers. He will work with your staff to see that you get high production efficiency, low unit costs, long tool life, and uniformly high product quality. Call your nearest Republic sales office for the facts. Or write to:

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Free-Machining Bessemer, Alloy and Enduro Stainless Steels

Union Cold Drawn Special Sections

Union Cold Drawn and Ground Rounds, Turned and Polished Rounds, and Turned, Ground and Polished Rounds (Union Precision Shafting)

REPUBLIC *Union* COLD DRAWN STEELS

REPUBLIC STEEL

(*Continued from Page 83*)

revolutionary process for recovering cobalt metal from ore concentrates, using entirely chemical techniques designed to be less costly than conventional smelting and refining methods.

Buffalo Hammer To Move

Buffalo Hammer Mill Corp., Buffalo, purchased a 16,000-sq-ft building in Lackawanna, N. Y. and is moving its entire works to that location. The company makes hammer mills and related crushing and grinding equipment.

Boilermaker Appoints Agent

Orr & Sembower Inc., Reading, Pa., appointed Charles M. Setzer & Co., Charlotte, N. C., as sales and service representative for its packaged automatic boilers.

Fisher Builds Chemical Plant

Fisher Scientific Co., Pittsburgh, is constructing a plant for its Chemical Division in Fair Lawn Industrial Park, N. J. In addition to two buildings devoted to manufacturing reagent-grade chemicals, laboratory analysis and packaging, a third building will house a research section for the development of new chemicals and new chemical sources.

Tech-Pacific Corp. Organized

Curt W. Bohman and Joseph J. Musil organized Tech-Pacific Corp., Newport Beach, Calif., for exclusive distribution in 11 western states of several Swedish and American precision machine tools.

Textron Buys Dalmo Victor

Textron Inc., Providence, R. I., purchased Dalmo Victor Co., San Carlos, Calif., manufacturer of airborne radar antennas. Dalmo also is developing shipborne radar antenna systems and design-through-production projects on other precision electromechanical equipment. Dalmo makes such microwave components as waveguides, mixer-duplexers, directional couplers, feed horns, rotary joints and rotary switches—all of magnesium.

Toolmakers Aid Apprentices

National Tool & Die Manufacturers Association, New York, will publish a textbook for apprentices, entitled *Fundamentals of Tool and Die Making*. It follows the production of a new color film, "Tool and Die Making—Keystone of Mass Production," which has a sequence on apprentice training.

Detrex Opens Branch Office

Detrex Corp., Detroit, manufacturer of industrial cleaning equipment, chemicals and drycleaning machines, completed its branch warehouse and office at 3027 Fruitland Ave., Vernon, Calif., a suburb of Los Angeles.

American Zinc Reduces Output

American Zinc, Lead & Smelting Co., St. Louis, will close its Hillsboro, Ill., metal operations which are being operated by its subsidiary, American Zinc Co. of Illinois. The shutdown will be effective Mar. 1 and will continue for an indefinite period. This plant is currently producing at the rate of 650 tons of slab zinc a month. Curtailment is the result of unsatisfactory price prevailing for slab zinc.

American Zinc's Grasselli mine at New Market, Tenn., which is being operated by American Zinc Co. of Tennessee, will be closed Mar. 1 for an indefinite period. The mine is producing concentrates at a rate of about 1060 tons a month of 60-per-cent grade.

Flato Bros. Expanding

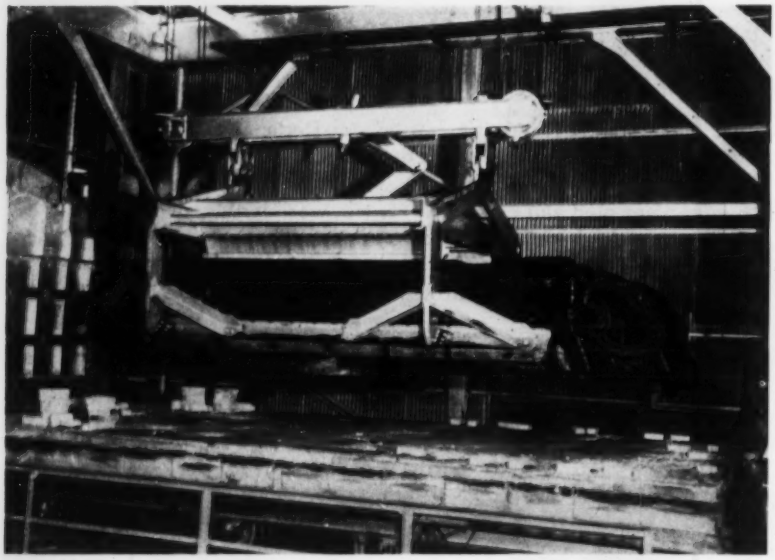
Flato Bros. Mfg. Co., Birmingham, will build a $1-million plant at Oneonta, Ala., for production of components for the Chambers gas range.

Instrument Firm Names Agent

Penn Industrial Instrument Corp., Philadelphia, appointed Snyder Co. Inc., Tulsa, Okla., as its representative in that area.

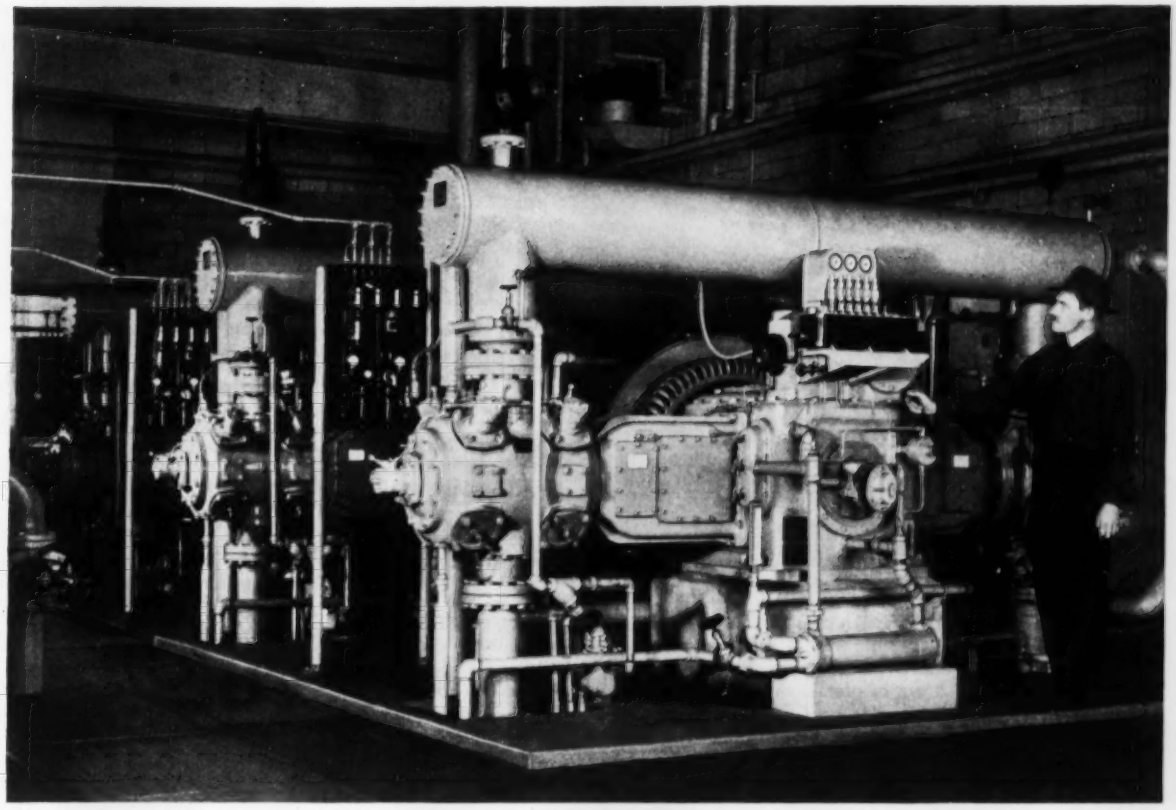
Heads Aluminum Extruders

John Doering was elected president of Aluminum Extruders Council, Washington, an organization representing the nation's independent nonintegrated extruders of aluminum. Mr. Doering is plant manager and assistant to the president of J. S. Thorn Co., Holmesburg, Pa. Other officers are Milton J. Smith,

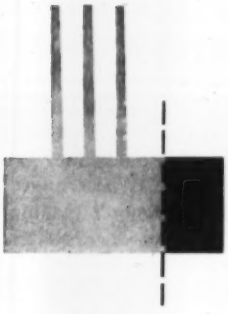


Automatic Tongs Speed Movement of Cast Steel Hulls

Cast steel hulls for Army tanks are lifted quickly and safely by automatic tongs especially designed by Heppenstall Co., Pittsburgh, for General Steel Castings Corp., Granite City, Ill. Having a capacity of 40,000 lb and used in conjunction with other specially built equipment, they permit the operations of heating for hardening, quenching and tempering to be handled by remote control



Compact, totally enclosed Clark Compressors cut space and building costs in Packard's Jet Engine Power Plant



Compressed air for all manufacturing operations in Packard Motor Company's new jet engine plant, Utica, Michigan, is furnished by three Clark 200 hp Balanced/Opposed Motor Driven Compressors.

Because of their totally enclosed, dust-proof design, Packard was able to install the units directly behind the boilers, with no partition wall between. Floor-space requirements and building costs were thus reduced.

By selecting the compact Clark CMA-2, Packard was able to provide the flexibility of a three-unit installation, within an exceptionally small space, to meet varying plant air demands.

For *any* industrial air compressor applications in the 150 - 4500 hp range — compact, vibrationless Clark Balanced/Opposed Compressors are your most practical answer. Complete information is in Bulletin 118, available on request.

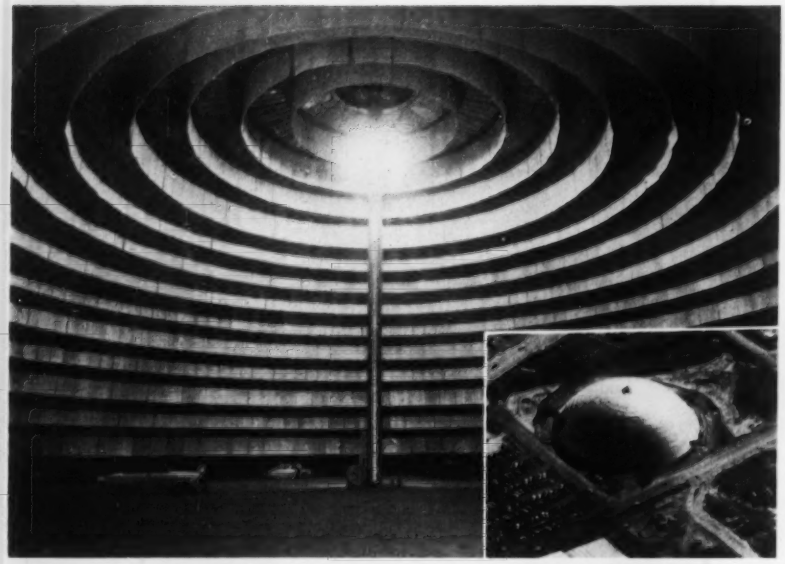
CLARK BROS. CO. • OLEAN, N. Y.

Division of Dresser Operations, Inc.

Sales Offices in Principal Cities Throughout the World

PRECISION BY THE TON **CLARK** **balanced/opposed compressors**

© 1953, Clark Bros. Co., Division of Dresser Operations, Inc.



LeTourneau Building Provides Extensive Floor Space

This semisphere building, a product of R. G. LeTourneau Inc., Longview, Tex., has no interior structural supports; the 94-ft center pole is used only in erection and is not necessary for support of the completed building. All assembly work to create it out of aluminum and steel was accomplished at ground level. Twelve thousand people can be seated in the huge structure. It has a height of 85 ft, has a diameter of 300 ft and a circumference of 942 ft. The dome covers 70,686 sq ft of floor area and contains 3,289,402 cu ft of enclosed space

Trim-Alloys Inc., Boston, first vice president, and Sam Henry, Superior Industries Inc., Youngstown, second vice president.

Producto Corp. Moves Plant

Producto Corp., Detroit, manufacturer of die sets and diemakers' equipment, moved to larger quarters at 10200 Capitol Ave., Oak Park, Mich.

Research Center Opens in Ohio

Research activities of Vanadium Corp. of America, New York, are being concentrated in a new research center at Cambridge, O. Objectives include services to customers in developing new and improved Vancoram products, raw materials, and processes; guidance and control of quality; study of metals industries' technical needs; and co-operation with university research centers. First unit of the center, opened late last year, provides 30,000 sq ft of metallurgical and chemical laboratories for the evaluation of metals and alloys. Scheduled for early completion is a second unit, housing pilot plant facilities in which actual production tests of laboratory findings will be made. William E. Mahin is Vanadium's technical director. The corporation is a producer of vanadium and ferroalloys and is a leading miner and miller of uranium.

Baldwin Products Expands

Baldwin Products Corp., San Gabriel, Calif., expanded its facilities for processing of beryllium-copper precision items, both for the electronic and aircraft industries, and processes for the heat-treating of silver alloys.

Investment Casting Co. Moves

Investment Casting Co. moved to 60 Brown Ave., Springfield, N. J. Casting in ferrous and nonferrous alloys, this company offers both lost-wax and shell-molding facilities.

Ohrstrom Buys Inet Inc.

G. L. Ohrstrom Associates, New York, purchased Inet Inc., Los Angeles, manufacturer of magnetic amplifiers, rectifiers, shipside power and supply equipment. Other Ohrstrom holdings in Los Angeles include Leach Relay Co., Jeffries Transformer Co., and Palmer Electric Manufacturing Co.

Promat Names Representative

Promat Division, Poor & Co., Waukegan, Ill., appointed Swift Industrial Chemical Co., Canton, Conn., as representative for its metal finishing, treating, cleaning and descaling compounds.

Surface Plate Firm Names Agent

Rahn Granite Surface Plate Co., Dayton, O., appointed Sterling Sales Inc., Worcester, Mass., as distributor in New England for its line of black granite surface plates, angle plates, parallels and straight edges.

Dusing & Hunt Buys Plant

Dusing & Hunt Inc., Buffalo, manufacturer of metal specialties, purchased Le Roy Plow Co.'s plant in Le Roy, N. Y. Dusing & Hunt will continue to operate its Buffalo plant and the new facilities reportedly will be used for expanded production of a number of products. Manufacturing operations are expected to begin in several months after extensive remodeling.

Koppers To Build Laboratory

Metal Products Division, Koppers Co. Inc., Pittsburgh, will build a mechanical development laboratory at the firm's South Baltimore, Md., plant. It will be devoted to the refinement and adaptation of present products and processes plus the development of new products. Operations of the laboratory will be directed by John W. Pennington, manager of the division's technical department. Walter F. Perkins is vice president and general manager of the division.

Regular products of the division include self-aligning couplings which transmit power in industrial equipment; electrostatic precipitators for cleaning industrial gases; fans for industrial cooling; gas-producing apparatus and storage tanks; piston and sealing rings for aviation, marine and industrial applications. The division also makes

eliminate the guesswork in selecting tool steels

Thousands of metal working people are using the Crucible Tool Steel Selector to determine exactly which type of steel they need. This handy selector covers 22 tool steels which fit 98% of all tool steel applications.

The selector is unique because it starts with the ultimate use of the steel. It breaks down all tool steel applications into six major classifications, under which the different grades of steel available for certain specific requirements are indicated in legible cutouts. Heat treatment and machinability data are also included for each grade.

A flip of the dial will give you the answer, and almost just as quickly you can get the steel you select. For each type of steel shown on the selector is in stock in Crucible warehouses, conveniently located throughout the country.

To get your Selector merely fill in the coupon and mail. There is no obligation whatsoever.

⅓ actual size, Selector is in 3 colors

HERE'S AN EXAMPLE:

Application — Deep drawing die for steel

Major Class — Metal Forming — Cold

Sub-Group — Special Purpose

Tool Characteristics — Wear Resistance

Tool Steel — Airdi 150

A turn of the dial does it! And you're sure you're right

Crucible Steel Company of America
Dept. S, Oliver Building
Pittsburgh 22, Pa.

Name_____

Company_____ Title_____

Address_____ City_____ State_____

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **TOOL STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

special metal equipment and parts under contract.

Hyster Appoints Distributor

Hyster Co., Portland, Oreg., maker of materials handling equipment, appointed Bode-Finn Co., Cincinnati and Dayton, O., as its distributor in southwestern Ohio, northern Kentucky and southeastern Indiana.

Buys Perforated Metal Firm

Douglas E. McKey, former vice president of manufacturing of Burlington Mills Inc., Burlington, Wis., purchased the assets of Nortmann-Duffke Co., Milwaukee, job metal perforators and manufacturer of perforated metal products. The new owner plans expansion of the company's activities.

Nikoh Tube Names Distributor

Nikoh Tube Co., Chicago, manufacturer of electric-weld steel tubing, appointed W. J. Erdell and E. F. Zimmerman, as Ohio representatives. Mr. Erdell, president of Industrial Formed Steel Inc., Warren, O., was formerly field metallurgist and director of sales, Damascus Tube Co., Greenville, Pa. Mr. Zimmerman, vice president of the Warren firm, was previously sales manager, Aluminum & Special Products Division, Nottingham Steel Co., Cleveland.

Aluminum Group Names Officers

Aluminum Association, New York, re-elected D. A. Rhoades, Kaiser Aluminum & Chemical Corp., Oakland, Calif., as president. Arthur V. Davis, Aluminum Co. of America, Pittsburgh, was re-elected chairman of the board and Donald M. White was reappointed secretary and treasurer. The following vice presidents were re-elected: S. D. Den Uyl, Bohn Aluminum & Brass Corp., Detroit; Raymond Deutsch, Monarch Aluminum Mfg. Co., Cleveland; and R. P. Stranahan, Stranahan Foil Co., South Hackensack, N. J.

Chairmen of the association's active commodity divisions are F. W. Boynton, Reynolds Metals Co., Louisville, Extruded Products Division; R. P. Stranahan, Stranahan Foil Co., South Hackensack, N. J., Foil Division; R. G. Tessendorf, Aluminum Industries Inc., Cincinnati, Foundry Division; L. M. Brile, Fairmont Aluminum Co., Fairmont, W. Va., Sheet Division.

Cleveland-Cliffs Absorbs Unit

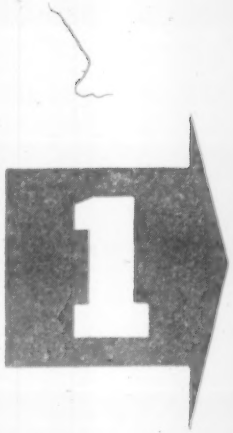
Cleveland-Cliffs Iron Co., Cleveland, announced that its subsidiary, Cliffs Power & Light Co., was dissolved as of Jan. 29. The latter company disposed of its transmission and distribution lines on Dec. 15, 1953, to Upper Peninsula Power Co. and ceased to operate as an electric utility company at that time. The firm's electric generating stations were retained to furnish electric energy for the operation of Cleveland-Cliffs Iron Co. All assets and liabilities of the subsidiary company will be absorbed by the parent company and the generating and other facilities will be operated as the electric power department of Cleveland-Cliffs Iron Co. under the continuing management of J. D. Preston.

Rasmussen Mfg. Co. Sold

Rasmussen Mfg. Co., Hollydale, Calif., has been purchased by R. A. Newton, former partner and general manager of Rasmussen; L. A. Theisen, formerly vice president and sales manager of Falcon Products Inc., Pomona, Calif.; and W. G. Wellington, formerly vice president and chief engineer of Falcon. The plant will operate under the name of Ramsco Corp. and will continue to manufacture such products as engine liners, sleeves and oilfield specialties and will engage in general machine work.

Taylor Dynamometer Moves

Taylor Dynamometer & Machine Co. transferred its general office and research-development department to a recently completed building at 6411 River Parkway, Milwaukee. Some manufacturing and assembly work also will be carried on at the new location. The company makes static balancing machines, dynamometers and high-speed small-hole drilling machines.



STEEL's 1954 Management Series . . . .

The editors of STEEL herewith present the first in their ten-part series, Program for Management for 1954. The complete list:

1. Now You Have To Sell
2. Training Management Men
3. Automation—How Much?
4. Regularizing Production, Employment
5. Distribution — Integration Needed
6. Distribution — Training Personnel
7. Distribution — Transportation
8. Product Diversification
9. Foremen—Bridge to More Efficiency
10. Product Design

. . . Now You Have To Sell

WHEN THEY HEARD officials of McBee Co. predict its sales in 1954 would bulge 17 per cent over a fat 1953, sales executives at the American Management Association's Marketing Conference last month sat up and took notice.

That's a considerable accretion to expect anywhere this year and especially so in the rough and tumble office machinery and equipment business. A panel of McBee management men told in detail how they intended to achieve it. The techniques were what the audience wanted to hear.

The ABCs — McBee's selling strategy calls for: A 10-per-cent increase in its 300-man, 75-branch selling force; a comprehensive training program to increase sales per salesman; cultivation of new markets; and more thorough coverage of present customers for new applications. Manufacturing costs will be tightened with new production equipment; new product introductions will be carefully preplanned.

Branch managers, many of them inexperienced in selling even under moderately adverse conditions, must be reoriented. Advertising appropriations will be higher and for the first time in years all magazine ads will be couponed in a drive for inquiries to reduce total canvassing time. Salesmen will be given extra help in planning their work and budgeting their time, will be watched closely to block discouragement.

Help Wanted—Eagerness with which executives absorbed ideas from this presentation and from 23 speakers at the New York marketing conference bears attest to the subject's importance. Attendance of 1150 was highest ever for an AMA marketing conference; this year the association will conduct 44 workshop or orientation seminars, seven more than last.

Other groups have likewise responded to the greater need for sales aid. National Industrial Conference Board held a three-day seminar on marketing last fall, marking the first time in its 37-year history a full day or more has been devoted to the subject. Another similar one-day seminar is scheduled in Los Angeles, Mar. 24. Nearly every day of the year National Sales Executives Inc. will sponsor a sales conference or clinic somewhere around the country. Its membership roster has swelled 15 per cent in the last year to 24,500.

Consumption Is King

Not since the days prior to World War II has so much attention been paid to bolstering the sales effort. Getting out production occupied industry continuously for more than a decade. Our capacity to produce has doubled in that time, but not our facilities for putting those goods in the hands of consumers.

Economy's Master—Sweeping in this tide of sales consciousness is the realization that goods are liabilities when produced and become assets only when sold. Consumption, not production, is now master of our economy.

If ability to pay were enough, there would be little problem. Our economy is based on people, and the national standard of living is now at a point where people can easily purchase necessities of life,

In a Little Red Schoolhouse

TUCKED AWAY in a corner off a network of overhead walkways spanning the five-acre plant of Simonds Saw & Steel Co., Fitchburg, Mass., is a red and white clapboard building within a building known as the "Little Red Schoolhouse."

Inside this air-conditioned soundproof structure is an industrial world in miniature. Banked on three sides are accurate scale models of Simonds products in action on jobs ranging from logging to hand filing. In an alcove at one end are sliding panels on which are displayed technical data on company products, their applications, maintenance and sales features. Other panels exhibit various phases of company advertising and sales aids. Visual training devices are attractive and informative; everything is aimed at creating a training course palatable to the trainees, who are frequently antipathetic to learning fundamentals after being out in the field selling.

Simonds' products are sold chiefly through distributors, and about 250 of them (motivated by such slogans as "Give your salesmen the jump on competition" and "Knowledge of the products you sell can be the winning hand") have sent salesmen to the Fitchburg school. The company reasons that the better informed distributors are about its products and operations, the better a selling job they'll do. From lectures and product primers students learn products to recommend for specific applications, get comparative analyses of Simonds' and competitors' products and pick up ideas on where to look for business.

Schooling is only one step in the company's sales plan. It's followed up with such selling aids as application and maintenance literature and charts, product manuals and product samples. Supplementing salesmen's activities are catalogs and educational films for customers, advertising and direct mail.

Significantly, the training program has been in operation since 1943, when most companies were still basking in the warm sun of postwar sellers' markets. Since then over 750 salesmen have gone through the school. Simonds believes that all salesmen, its own and those of its distributors, will leave a schoolhouse training course better informed, qualified and enthused to sell its products effectively.

leaving them a sizable portion of discretionary spending power. This ability of people to defer purchase of so many goods and services has become a key influence on the course of business and industry.

New Era—For the first time in many years there exists no unusual stimulus war, backlogged civilian demand, rearmament to maintain our high rate of production. We have progressed from an era of *supplying demand* into one in which we must *create a demand*.

Attitudes of sellers ingrained during 14 years of having things their own way are not easily dislodged. "Business has been lulled into a sense of complacency caused by long periods of prosperity," General Electric Co.'s George P. Park told a Detroit audience. What's needed, he believes, is a "sales brainwashing to eliminate thinking that gravy train economics is a normal business standard." In Chicago, Chrysler Corp.'s L. C. Colbert pointed out to bankers that "health of the nation's business will depend to a great extent on the success with which salesmen persuade the people of America to live as well as they can afford to live."

Job for Millions—Prime energizing force in stimulating people to fulfill their desire to live better is the nation's estimated six million salesmen. About two million of these are outside salesmen where a high degree of initiative and creativeness are all-important. Importance of salesmen's activities in our economy is shown by a *Printers' Ink* study based on the 1940 Census: Pay of 15.5 million people depended directly on his efforts and the welfare of 58 million people indirectly.

Today with five million separate items needed in our economy and millions of separate transactions taking place each day, our sales force is only about 30 per cent larger than in 1940. And the decline of personal selling during shortages has brought about a situation where sales skills have been surpassed by buying skills.

New Selling Era

Both sweeping changes and subtle alterations have come about in our economic system since the last time industry was forced to do a comprehensive job of selling. Families have moved into higher income groups where social standards and ways of life are quite different. They want television, air conditioning, new appliances, suburban homes. Air transportation has shrunk the world. Great new industries have arisen to challenge older ones and each other. Management has often been blind to the changes in technology, markets and marketing methods that affect its operations vitally.

Our Growth — Along with our economic growth in the last decade-plus has come a great social and cultural growth; it has changed our ways of living and thus our needs and buying habits. Companies must take cognizance of this great change, warns Fenton B. Turck of the engineering consultant, Turck, Hill & Co., or find themselves "grinding out ten-year-old-mind movies for an America that has matured."

We're not going back to selling conditions of the 1930s; we're not selling the same products or markets, nor do we sell them in the same manner. There is no precedent for the selling era we're en-

tering. A cardinal rule will still apply though: Find out what the other fellow wants and help him find the best way to get it.

Formula—We can maintain our economic stability and growth, suggests Walter Williams, under secretary of Commerce, by developing new and better products, designed to coincide more closely with desires of a rapidly changing market; employing more and better salesmen; improving and intensifying sales promotion and advertising; reducing distribution costs through better operations, methods and techniques in distribution; research to assess markets and potential markets, products and preferences.

The spur and discipline of stiff competition will force making and selling what the market wants, and at the same time will keep our business economy dynamic, well balanced, well managed. Sellers will find that medicine show merchandising won't move goods for long. They'll realize that price cutting is not synonymous with hard selling it's merely giving away profits. Already thoughtful executives in many areas are eliminating it as a major sales tool.

Management's Challenge

Responsibility for sales-slanting the company with proper emphasis and balance belongs to management. It must reappraise its leadership, setting objectives and policies, evaluating personnel, planning facilities, establishing control procedures.

Selling is now far more complex than when one man ran a company. Specialization in industry involves not one man but a group salesmen must reach. Communication is a pressing problem that must be solved if mass selling is to accompany mass production.

Selling Aids—Changing methods of marketing also change techniques of selling. Industry produces more specialized goods and must provide more technical aid for customers. Thus the greater use of sales engineers, who are welcomed for their knowledge. They must be indoctrinated in successful applications of sales principles to fortify the specialized knowledge.

Executives on the Campus

GATHERED at 185-year-old Rutgers University in New Brunswick, N. J., last summer were 114 sales executives and a 20-man faculty from business and colleges, representing the first management school designed expressly for sales executives. Sponsored by National Sales Executives Inc., New York, the Graduate School of Management & Marketing aims at developing men capable of stimulating more profitable sales.

The program is designed for mature, experienced men (preferably 33 to 55). There are no formal educational requirements; more important are the candidate's business accomplishments and responsibilities, including at least two years of sales supervisory experience and recommendation of his firm.

The concentrated course of study is based upon two resident summer sessions of two and one-half weeks each year, plus completing a written problem analysis before the second year. The subject matter is presented in a combination lecture-case history curriculum; liberal exchange of ideas in discussing specific sales problems pounds home the sales and marketing theory.

Response to the first session has been so enthusiastic that NSE expects enrollment this summer to quadruple and is planning another school solely for retail sales management. The sales executives' association believes the sales student leaves this training ground with these advantages:

- A better understanding of sales management techniques, in addition to greater factual knowledge.
- Ability to analyze more clearly his own work and problems, and to compare more critically his methods with current practices.
- Wider knowledge of the sales function and its relation to operation of other departments.
- A professional and scientific approach to sales management.
- Deeper sense of responsibility in his company's welfare, and ability to help strengthen his firm's relationship with its sales force and its community.
- A better understanding of the human and social environment in which his company operates.

Automakers, concerned about high unsold inventories, have dusted off old ideas and are trying new ones to blitz selling and public buying apathy. Packard Motor Car Co. plans to revive the almost forgotten telephone contact and home demonstration, is using graphic aids that work in selling appliances. Chrysler is expanding its field selling force 60 per cent. "Honest, intelligent, efficient, aggressive merchandising will move automobiles," says Pontiac's H. E. Crawford. Agrees Oldsmobile's L. F. Carlson: "Secret of selling is still hard work."

Modernization Market — Companies turning from sated expansion demands to servicing a replacement market find the potential huge. Modernization purposes took only 51 per cent of capital

expenditures in 1952, 57 per cent last year, and are projected at 62 per cent in the next three years. As the capital goods market tightens, machine tool builders, for example, are finding new sales impetus in automation opportunities, rebuilding work and leasing programs.

To concentrate its sales guns, Jones & Lamson Machine Co. has revamped its sales organization under product managers and established a manager of marketing. The company plans a 30-40 per cent increase in field sales staff this year and has developed a series of market potential indexes to know where to put men effectively. Also under way are simplified methods for estimating costs more accurately and quickly and a plan to furnish prospects with economic data to justify financially to their management the purchase of new machinery.

Product Development—Research into new products and improvement of old ones can pay off in increasing sales and ofttimes prod-

ucts diversification. A supplier to industry that's looking to consumer markets is Bay State Abrasive Products Co.

With the home workshop and "do it yourself" trend in ascendency, Bay State plans to tap the $17-18 million sandpaper market, thinks it has an excellent chance with its new Gritcloth, an open mesh sanding fabric for machine or hand use. A $1-million plant is going up to make Gritcloth, which the company believes has the potential eventually to account for 50 per cent of sales.

Marketing research, too, is becoming an increasingly important sales tool as management learns that fact-power is sales-power. Wise management is utilizing the proven techniques of marketing research (STEEL, Dec. 7, p. 125) to develop facts it needs for sound and workable decisions.

Designing the Structure

In streamlining the sales structure, first step is to determine what is needed to maintain adequate customer contact. Unless the sales force does an exceptional amount of missionary work, salesmen should be added as a general rule until the last man beyond training just manages to pay his way.

Sales territories must be outlined and grouped for effective control. Frequently territories are too large for effective, intensive and low-cost coverage. Decide whether to specialize selling by territory, product group or users. Line-staff relationships and levels in the field and at headquarters must be studied and fixed to get decisions and action quickly.

Time Wasted — Primary objective of your salesman is to write an order. In doing this he generally wastes a great amount of time needlessly, say sales experts. Often he calls where he's known and liked rather than where there's business to be won by hard work.

He also must be taught to plan his selling time and utilize it effectively. He must leave the office better prepared from training in selling methods, product knowledge and markets.

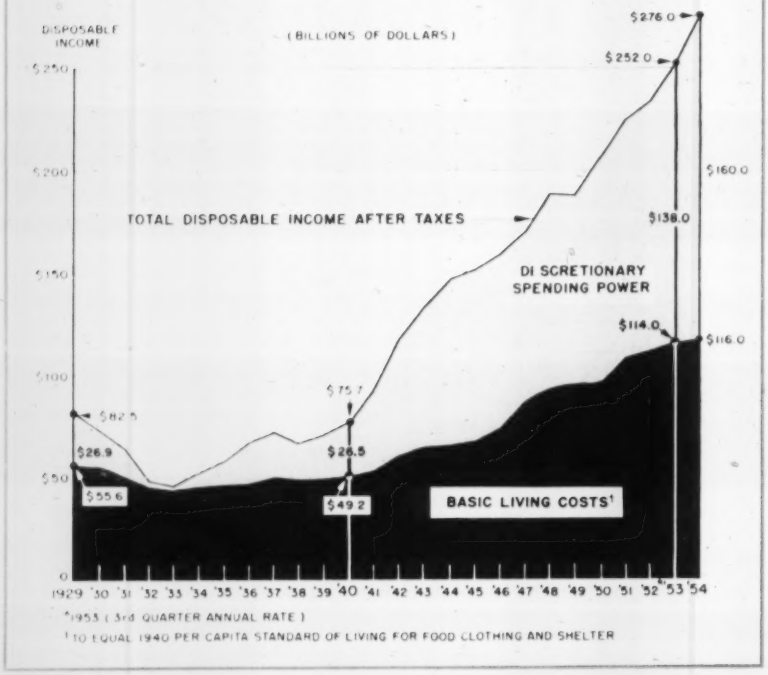
Sound training can supply him the selling tools he needs, yet today "training is still underrated and undersold," according to M. D. Hull, Tractor Division, Ford Motor Co. In setting up a training program, establish what training is needed, who needs training or retraining, who should develop an integrated program and carry it out, and what tangible results you expect to achieve. Helpful also is figuring total costs in terms of capital outlay and continuing expense.

Recruiting—As selling has become more complex, scientific and practical, so has training. Your sales representatives are a major capital investment; their selection should be planned carefully. One estimate of training cost: $5600 per man.

Where can they be recruited? A National Industrial Conference Board survey shows manufacturers look in these places: Colleges and universities, in other departments of their own organization, from advertising in newspapers and business magazines, from un-

The Dollars Left to Buy With

. . . the wherewithal is present, but the demand must be stimulated



solicited employment applications. Other sources include successful dealers and distributors, referrals by customers, trade associations, management consultants' referrals. Most-used screening systems are personal interviews, aptitude and other tests, investigation of references, application blank analysis, on-job evaluation, physical examinations.

Foundation Training — Every company has its own specialized needs that must be presented in training programs. Most of them provide a basic course for foundation training in all phases of company operations, policies and personnel. A number often have refresher courses for regular employees to keep them up to date on new developments and techniques.

A fresh approach to both training and upgrading is found at Chase Brass & Copper Co. Inc. In 1952 the firm reviewed all previous training methods and results, even asking men in the field "what would have helped you?" From the results was built a composite of how to do a balanced job effectively. Three distinct training courses were set up, the most unusual of which is a four-week "intermediate" course, bracketed by a seven-week basic course for new employees and a two-week refresher for outside salesmen.

On the Payroll—The survey of possible sources for new men also disclosed Chase had "diamond quality salesmen" right on its own payroll that were qualified for outside sales work, recalls A. L. Moeller. Often these men were in inside sales jobs and burning for a chance to get outside. The intermediate course was set up for them to present concentrated training in products, manufacturing processes, new equipment and advanced production techniques. It probes into company policies, procedures, products, markets and opportunities.

Men with sales aptitudes and potential go through the course in groups of eight. In addition to strengthening the sales department's effectiveness, the training provides a psychological boost to second-line personnel. It gives recognition to competent inside men who want to try outside selling, and it advances knowledge of inside men who don't make the change.

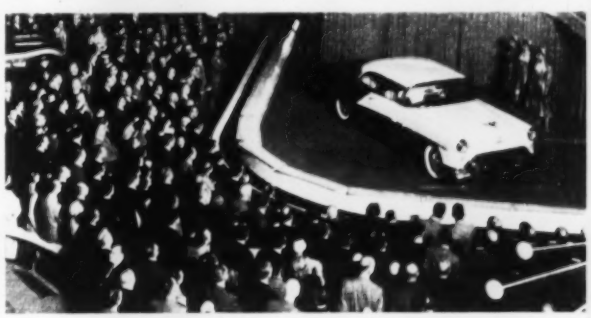
Keep It Up—Some form of continuing training for men in the field is equally important. Management must keep its men informed on changes in economic and marketing conditions that require corresponding revisions in sales patterns and use of sales skills. Refresher classes in the field office or regional meetings provide a link between schools and experience.

One technique of keeping successful men informed and stimulated on sales matters is termed sales situation training. Methods Engineering Council says it helps prepare the salesmen to overcome both anticipated and unexpected obstacles by knowing the best technique to use to fit the situation. Situations are those your salesmen identify as important and difficult to overcome, thus the plan is tailored to fit problems your field men encounter daily.

Forgotten Man — Don't forget sales supervisors. They're the men who keep salesmen on the right track, help crack the tough accounts, and curb the terrifying picture of competition new men often build up. Sales supervision can be a forgotten function, says Dr. Charles L. Lapp, Washington University. A survey by him showed only 83 out of 1086 salesmen of industrial products had been given training to prepare them for supervisory work. Actual supervision he interprets as a balanced program of properly supporting salesmen by continued training, control, motivation and communication.

Periodical appraisal of sales performance gives management sound control over a salesman's progress, his assets and liabilities. It also points up specific needs for further training and his potential for further development.

Teamwork — Because modern selling depends so much on teamwork, says Donald D. Couch, American Radiator & Standard



Pretested, Presold

RELIABILITY, the telling sales feature in the automobile's early days, has largely been supplanted. Motordom today is selling styling and performance with initial public reaction a major determinant of a model's sales success.

Annual changeovers, a key factor in the industry's growth, now rival the atomic bomb as a spectacle. Extravaganzas like General Motors' multi-million dollar Motorama not only serve to focus public attention on new models but presell the mechanical and styling ideas of tomorrow.

Dream cars play a multiple role. They are at once crowd-pulling magnets and laboratories on wheels for practical testing of both mechanical and style ideas. Equally important, automakers can take the public pulse on possible features of tomorrow's production-line chariots and implant the germ of public acceptance for the time when they do appear.

Sanitary Corp., the headquarters office should judge the district sales office only, giving the district manager tools for measuring individual performance within his staff.

Profitability is the basic measure of sales effectiveness, says Mr. Couch, and it takes the pressure off price cutting. But using this standard by itself may discourage long-term missionary selling and present problems in allocating overhead costs. His company developed a hypothetical average price for each product, including overhead. Then in effect products are sold to district offices for resale and profit of each sales office can be computed.

American-Standard also uses performance-against-quota measurement, which must be logical and attainable, reflecting realistically competitive situations, past sales developments, favorable distribution factors and current economic conditions. Control is the district manager's job, so he can quickly spot low performance areas and do something to correct the situation. To furnish a sound base for a fair incentive compensation plan, company is getting up a detailed field salesman evaluation report which considers general sales ability, character, personal traits, specific abilities and possibilities for promotion.

Watch Selling Costs

Flexibility of operations that can come from getting a company's break-even point down to a lower percentage of full capacity is a growing need. Management can then decide whether to accept this lower volume, reduce prices or spend the money to create demand. Better planning by sales executives in co-ordinating selling with all phases of production and financing is necessary.

Figure the Cost — A national survey by Sales Executives Club of New York shows average cost of an industrial salesman's call is $17.24. With 9.2 per cent of the calls resulting in orders, average cost per order is $187.39. Thus sales costs have an important bearing on profits, and few companies actually figure what it costs them to sell. A 1953 survey of 500 companies by *Sales Management* showed cost of salesmen in the field had increased 25 per cent since 1950.

"Creeping sales costs are often unrecognized," says W. F. Rockwell Jr., Rockwell Mfg. Co. "We feel that consistent analysis not only allows us to avoid drastic action when sales volume might decline sharply but also gives us consistent savings as we eliminate poor performance along the way."

Danger Signals — At Rockwell sales costs as well as volume figures are analyzed, compared and charted. Here's how the company goes about it: Sales expenses are budgeted by individual classifications. Each headquarters department and district office is responsible for a quarterly budget covering all expenses; these go into a master budget. Monthly reports of actual expenses incurred for each classification are made and monthly statistics charted against past performance and against sales volume. Charts are kept on an index base with monthly figures converted into percentage of base, to compare widely divergent dollar volume figures. Indicators of performance are ratios, such as cost per $100 in orders received.

Market research department provides management with a "danger signal" report which highlights expense classifications out of line with previous months or trend of other classifications. Various classifications of expense are also compared on a straight percentage basis with orders received and with shipments to chart trends. Monthly analysis also picks up flagrant violations of expense policy. Company has found awareness that sales costs are so thoroughly analyzed causes both administrative and sales forces to preplan their operations more carefully too.

Money in Bank—Every dollar of field sales expense saved is automatically converted to dollars, emphasizes H. L. Franks of General Electric Co.'s Chemical Division. He figures the average salesman costs $16,000 a year to maintain in the field, works 250 days a year at a daily cost of $63, and averages three calls a day.

On this basis, he costs $21 each time he pushes open a door. If his expenses are 10 per cent of

Help Your Customers Sell . . .

YOU CAN SELL your own sales by helping your customers sell. It's an area many manufacturers only make token gestures toward or simply ignore.

Outstanding example of helping build business with ultimate consumers is Anaconda Wire & Cable Co. which has joined forces with electrical contractors, distributors and utilities to help them win a profitable share in the multibillion dollar wiring modernization market.

The company sends out to these middlemen a hard-hitting and complete how-to-do-it sales promotion package to help them sell better wiring in farms, homes, industrial plants and commercial establishments. Titled "Full Power Ahead," it's a compact wrap-up of sales tools and major sales points that utility men, contractors and distributors should have to promote replacement of obsolescent wiring. Among the tools: Description of how wiring modernization work can be financed by property improvement loans insured under the National Housing Act, direct mail campaign pieces for specific markets, instructions for dovetailing efforts by contractors, utilities and distributors to achieve maximum results, outline of what Anaconda will do when working with each.

In Picking a Salesman, Look For:

1. **Intelligence and ability to act on own responsibility**
2. **Leadership**
3. **Experience**
4. **Good business judgment**
5. **Organizing ability**
6. **Co-operative attitude**
7. **Previous sales record**
8. **Pleasing personality**
9. **Mental adaptability**
10. **Business contacts**

How To Forecast Sales

APPROACHES to sales forecasting fall into one or a combination of several of these classifications:

Jury of Executive Opinion—a sales forecast based upon a cross section of the views of a small group of top company executives. Opinions may be supported by considerable factual material.

Sales Force Composite—a sales forecast arrived at by combining the individual forecasts of the salesmen, or various strata of sales management.

Correlation Analysis—a statistical method of determining and measuring the relationship between company sales and other activities. By observing or forecasting the trend in these other activities, company sales can be forecast.

Trend and Cycle Analysis—a study of the basic factors underlying fluctuations in sales. Object is to predict future sales by estimating probable trend of underlying forces.

Industry Forecast—a sales forecast arrived at by first forecasting outlook for total industry and then estimating company's share.

Product Line Analysis—a forecast developed by combining the results of independent forecasts of sales of various product lines.

End-use Analysis—a forecast developed through a study of the outlook in major consuming industries.

sales, he must sell $210 per call on the average to justify his existence. By making one more call per day he reduces cost per call to $16, thus increasing his exposure to sales opportunities.

Selling Aids

"Selling is not a matter of brute force," said Robert F. Elder, marketing consultant, to the 15th New England Sales Management Conference in Boston last month. It requires attractive products, well packaged, strategically distributed and presented to the consumer in such a way that he senses the benefit he will get from purchasing them.

In agreement is William C. Stolk, American Can Co.: "The art of selling must have as its very foundation good quality of product, intelligent planning, excellent service and a price structure that justifies itself in the light of these values."

Spoiler — A slipshod approach after an order is in can ruin many a satisfactory sale. Failure to fill orders promptly or to service them correctly often makes the difference between repeat business and a switch to your competitor. Improved order-handling techniques and minimizing the small order problem will also prevent sales headaches.

By making your whole company sales-conscious you can help create satisfied customers. Telling employees how selling fits in the business picture can make everyone think in terms of increasing sales volume and profit. Pitney-Bowes Inc. has a suggestion system set up for employees to pass leads on possible new accounts to salesmen and pays them part commission for each sale made.

Motivate—Sales enthusiasm is not always self-generating, and management must often supply the motivating force. This can come by helping salesmen clarify their objectives, says Paul R. Larimer, Ansul Chemical Co. "A man needs encouragement in determining where he wants to go and identifying steps he must take to gain this objective." As keys to motivation, Mr. Larimer cites seven needs of individuals: Personal recognition, participation, fair compensation, understanding of personal problems, confidence in management, product respect, opportunity.

Management should listen to salesmen instead of just telling them, suggests Bakelite Co.'s C. W. Blount. Men in the field want to know how their division and the company is doing, to be kept up to date on technical developments, to hear company information before it's made public, to count on carefully prepared sales aids. They do not want to be talked down to.

Tie-In Advertising Good sales tools must be sharp and salesmen must know how to use them. Increased sales volume and profit do not necessarily follow mere spending of advertising dollars, commented Westinghouse Electric Corp.'s R. P. Wagner at a Minneapolis sales conference. "They should know exactly what they are supposed to accomplish." Advertising must also be interpreted to salesmen, believes Mr. Wagner, as without a clear understanding of how advertising supports his selling efforts, the salesman can't get maximum profits from it.

Today's advertising contains a lot of "stoppers" when it's "starters" that are needed, salesmen complain. Industry men must develop greater skill in presenting their products from the customers' viewpoint. By using appeals that will be more effective in convincing people to buy the product, they will be harnessing this extra sales horsepower of advertising.

Future Opportunity

As ours is not a static economy, the future offers tremendous opportunity for growth and development under the stimulus of competition. "We have immediate opportunity for a 10-per-cent increase in 1954-55, and the broader opportunity for a third higher standard of living by 1958," predicts Arno H. Johnson, J. Walter Thompson Co. He marshals an

Self-Quiz for Salesmen

By Charles L. Lapp, Associate Professor of Marketing, Washington University

1. Have you set personal achievement goals for the next quarter, six months or year?

2. Have you recently re-evaluated the benefits customers and end users of your product receive from your efforts?

3. Do you check your wardrobe for frayed cuffs, rundown heels and items that may date you?

4. Do you check yourself after each sales presentation to make sure you didn't bluff, exaggerate, use trickery, make misleading statements or promises which couldn't be kept?

5. Is there new information about your product or the business of your customers that you have not become familiar with?

6. Do you call on some customers too frequently in respect to their purchases and potential while you do not call on others frequently enough?

7. Are you constantly on the outlook for new customers?

8. Do you lose a great deal of valuable selling time—dawdling over a second cup of coffee, in general conversation or waiting—when appointments and better planning would have averted the loss of time?

9. When you do have to wait for an interview, do you use such time for self-improvement, making out reports, and preapproach analysis of prospects?

10. Are you keeping up-to-date and in good condition all your selling aids such as prospect lists, samples, catalogs, price lists and sales portfolios?

11. Have you checked critically your sales presentation for overworked words, slang, negative selling, irritating phrases and annoying mannerisms?

12. Are your sales techniques so obvious that you should attempt to develop different sales approaches and sales presentations for different types of buyers and individuals?

13. Do you have good answers to all objections which are commonly occurring?

14. Do you give your prospects a chance to state what they want and what objections they have to your proposition?

15. Are you handling competition in such a way as not to offend buyers?

16. Do you have a number of ways of asking your prospect to buy?

17. Do you keep sufficient records to know what products you are selling to what types of customers and how frequently purchases are made?

18. Are you a good sport if you lose a sale or a customer?

19. Do you hang around too long or rush out too quickly after a sale is made?

20. Do you follow-up with after-sale details to make sure that you keep a buyer completely satisfied?

impressive array of statistics to bolster this tenet.

There are seven powerful, but largely hidden, internal pressures for expansion building up in our economy, says Mr. Johnson. "All will have a strong influence during the next few years, both culturally and spiritually, as well as in the material sense." These hidden pressures are:

1. Change in the discretionary spending power of the mass of the population—now over five times as great as in 1940.

2. Change in the age make-up of our population—with over 65 per cent more children under five years than in 1940.

3. Change in the education level of our people—with 80 per cent more high school graduates in our adult population than in 1940.

4. Change in obsolescence and age of our dwellings—with 87 per cent now over 20 years old and 50 per cent over 30 years old.

5. Change in number of motor vehicles—with 72 per cent more vehicles than in 1940 putting added pressure on roads, streets, garages and parking facilities that were not adequate even for the lesser number of vehicles in 1940.

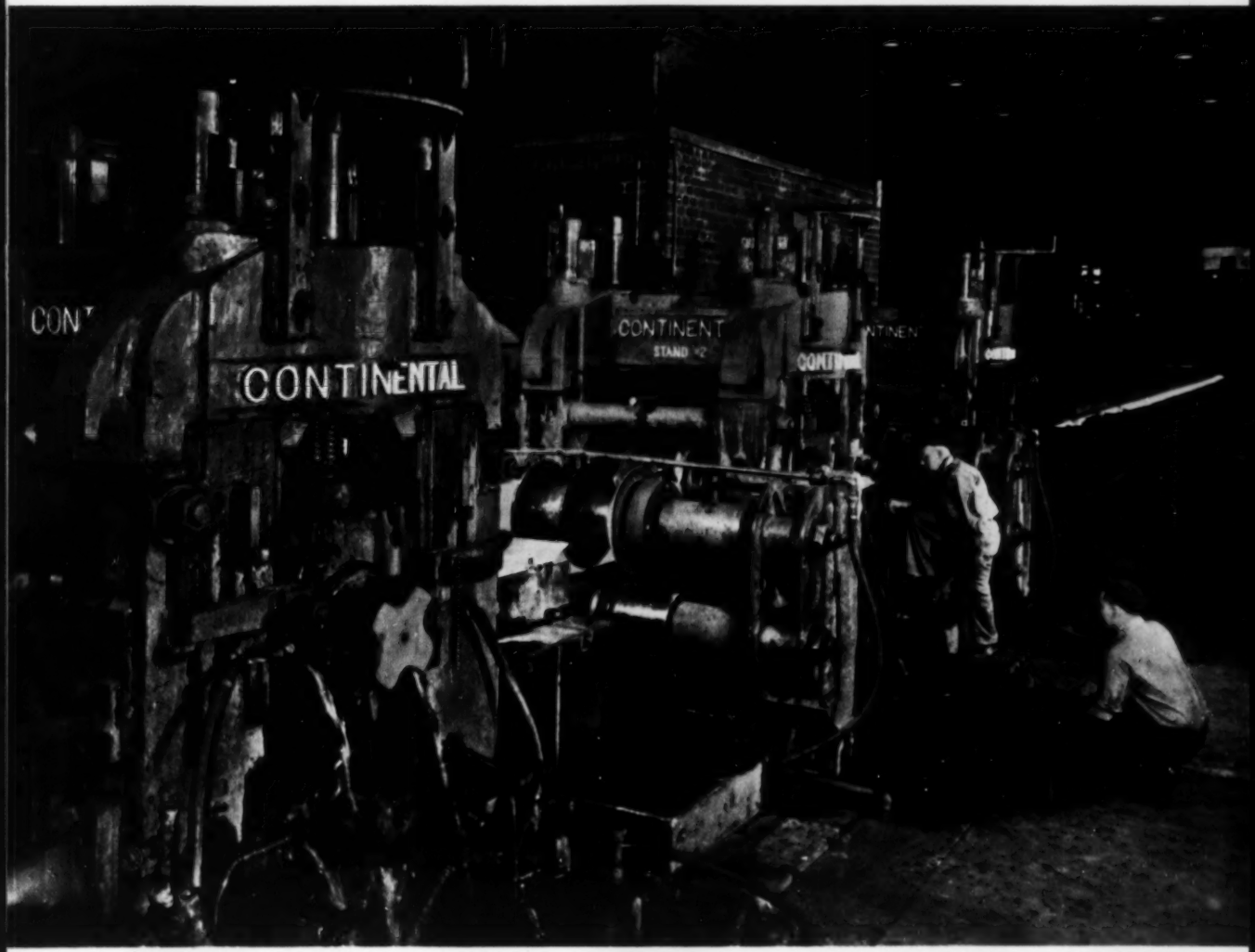
6. Change in our farm population—with a drop of 7.5 million since 1940 and a net shift of about 14 million people to nonfarm population adding to the need for a high level of nonagricultural production and employment.

7. Population shift to the suburbs—with a population growth in suburban areas of large cities five times as rapid as in the rest of the country outside of metropolitan areas.

We have the productive ability and the tools and materials of production, comments Mr. Johnson, for at least one-third higher sales to consumers. We have the purchasing power, after taxes and in spite of past inflation—both in terms of current earnings and in a vastly increased backlog of savings—to increase substantially our standard of living. "We have experienced the miracle of production," he declares. "Now, through the magic of consumption, we have the opportunity to keep our economy dynamic and growing."

CONTINENTAL

21-INCH CONTINUOUS BILLET MILL



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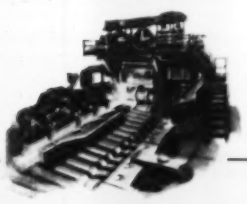

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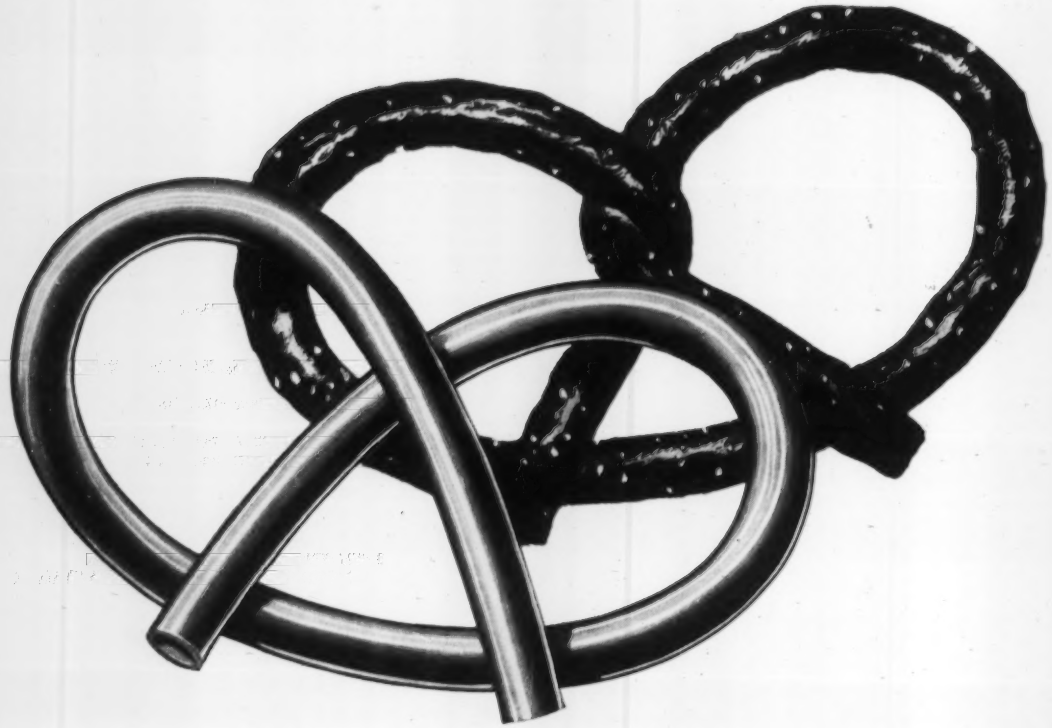

what's a pretzel got to do with tubing?

Just this—like a pretzel baker, OSTUCO is a specialist in bending, too! But it is only one of OSTUCO's many versatile facilities for manufacturing, fabricating, and forging. You'll always find OSTUCO a dependable *single source* for both carbon and alloy steel tubing, and its quality is strictly controlled from raw materials right on through to prompt shipment to you. If you're presently using tubing or if you're considering its use in your product, write for our newest catalog, "OSTUCO TUBING." Better yet, send us your blueprints for a quotation. OSTUCO's engineering and design staffs are always available to to work with you on problems concerning tubing.

By the way, did you know that Shelby, Ohio was the birth place of the seamless steel tube industry in America?

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OSTUCO TUBING

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Technical Outlook

IGNITRON PREDICTION— Advantages of ignitron rectifier power supply, over conventional rotating sources, should make it the conventional hot strip mill drive power of the future. So prognosticated two Westinghouse Electric Corp. engineers at the recent AIEE meeting in New York. Conclusion was based on success of the ignitron application at Fairless Works, U. S. Steel Corp.

MONEL CASTABLE ALLOY— Hot off the press is an International Nickel Co. bulletin describing their new "S" Monel alloy. It's an age-hardenable casting alloy that provides unusual strength, hardness and anti-galling properties at temperatures up to 1100° F, in addition to the general corrosion-resistance of Monel. Silicon content of 3.5 to 5.0 per cent gives it its precipitation hardening characteristics.

COATING PROSPECT— Boron (pure or in combination with other elements) appears to have a bright future as coating for metallic and nonmetallic materials. For example, if base material is silicon, zirconium, vanadium or tungsten, their borides offer a range of chemical, wear and heat-resistant properties. Boron and most borides resist oxidation up to 2400° F.

DEBUNKED— Sweeping claims made for plastics in the metal-fabrication field are refuted by Frank L. Bogart, sales engineer in charge of the Detroit branch, Marblette Corp. In his talk to the Steel Plate Fabricators Association, he said, "You have all heard that plastic tooling can be made overnight, at a cost of 10 per cent of hard metal tools. It ain't necessarily so." Mr. Bogart went on to point out that plastics, applied to the right jobs can effect substantial savings, but that the metals and plastics work together as a team to bring about production advances. He told the group that the correct use of plastics must be considered in relation to production runs. Plastics are particularly attractive for the short runs.

2000 VOLTS IN A SNUFF BOX— Thanks to printed circuit techniques and a mechanical driving system similar to that on a child's toy pin wheel, two National Bureau of Standards researchers were able to build an electrostatic generator the size of a can of snuff. The tiny device puts out the necessary 2000 volts at 10^{-14} amps for radiation detection devices. It's simpler, cheaper and avoids use of expensive special batteries. Pumping the tiny drive lever charges the storage capacitor in a matter of seconds.

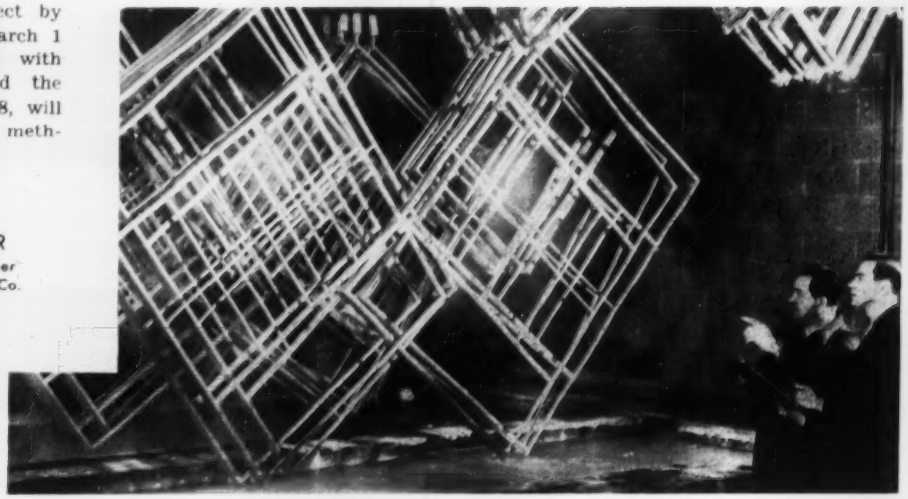
PRECOATED COST SAVER— It looked like Jayem Mfg. Corp., Brooklyn, would have to expand their painting department when stamping production began to soar, but a switch to precoated metal strip saved the day. Enamelstrip Corp. supplies the coils. Cost cutting took place not only in finishing, but in press feeding time, material handling, scrap loss and rejects. Totaled up, production cost savings on addressing machine plate trays amount to 50 per cent.

FROM THE BOTTOM UP— Grimson Astor, Ltd., Bideford, England, constructs its aluminum launches on the "two-way tension" technique. First, aluminum sheets are laid out flat and riveted together. Gunwhales, stringers, engine bearers and bilge keels are then fastened to them. Next, the transom and former frames are set up. Prefabricated shell is then drawn up from the keel to form a round, bilged hull. Double curvature is said to result in a flexed, drum-like surface. Another advantage — launches can be transported flat, to be assembled at their destination.

Metalworking Outlook—p. 43 Market Outlook—p. 139

This is the first of three articles on the subject by Mr. Frazier. The March 1 installment will deal with dross formation; and the final one, on March 8, will cover materials and methods.

By K. S. FRAZIER
Chief Research Engineer
Detroit Steel Products Co.
Detroit



CONTROLLED Hot Dip Galvanizing

PART 1

Length of submersion is one of the vital questions. Research shows that beyond five minutes there is a decided increase in tramp particles and formation of dross

IT IS generally recognized that the life of a zinc coating over steel under given atmospheric conditions is directly proportional to the thickness of the coat.

Exceptions to this rule of thumb, however, have considerable bearing on coating life. These are the exceptions we wish to consider.

Reasonably clean base metal dipped into molten zinc will generally produce a good protective coating, but close controls have been slow in finding their way into industry.

End purpose is to show that rigid controls in the hot dip process are not merely good housekeeping. They are profitable to both the galvanizer and his customers.

Process—Alloying action of zinc and iron in the hot dip method produces a denser coating than in any other form of zinc application.

Density is an added protection against corrosion and gives greater life, since it slows down the sacrificial requirement of the zinc to protect the iron.

As the alloy growth is allowed to continue after its normal original growth, the compact vertical crystals become more tree-like and irregular, increasing the porosity of the coat. As porosity increases, the sacrificial corrosion of the zinc to fill the voids becomes greater and lessens the effective advantage of the thicker coat.

Tests—Since the zinc-iron alloy grows while the base metal temperature comes up to the temperature of the zinc bath, heavy materials, such as structural steel, will normally accept a heavier coating than light-weight sections, such as steel windows. Findings here apply in many instances to heavier material, but all tests were made with lighter sections.

Coupons, 1/16, 1/8 and 3/16-inch thick, were prepared. After thorough cleaning, they were placed on the same rack and lowered into molten zinc at 850°F for one minute. Coupons were then stripped (ASTM Procedure A-90) to find the weight of the accepted coating.

Results of three tests: The 1/16-inch coupons picked up 2.85 ounces of zinc per sq ft of plate or 1.42 ounces of zinc per square foot of surface; ⅛-inch coupons picked up 3.28 ounces of zinc per sq ft of plate or 1.64 ounces of zinc per sq ft of surface; the 3/16-inch coupons picked up slightly more coating than the ⅛ inch.

Zinc-iron alloy is peculiar to thin sheets, but beyond 3/16-inch thickness, change in alloy growth is not material.

Difference—It is common practice in industry to record the weight of zinc coatings in relation to weight of black steel being galvanized. This must not be confused with the above findings.

A 1/16-inch steel sheet will have about 100 per cent more surface per pound of black steel than ⅛-inch sheet, while zinc coating per sq ft of surface will be only about 13 per cent less. Weight of zinc coating accepted on 1/16-inch steel will be about 75 per cent more per pound of steel than ⅛-inch sheet.

Next Test—Turning to light, irregular sections, a testing program was set up, using 72 samples of four different sections of different weights.

Units were galvanized at three different temperatures of molten zinc—840, 850 and 860°F. Immersion periods were about 1, 1½, 2 and 2½ minutes. All accepted coatings were photomicrographed and stripped to find weight of coating. (See figures 1 and 2.)

Results — Within temperatures and submersion times, relatively uniform coatings were well proportioned between zinc-iron alloy growth and free zinc. Excessive

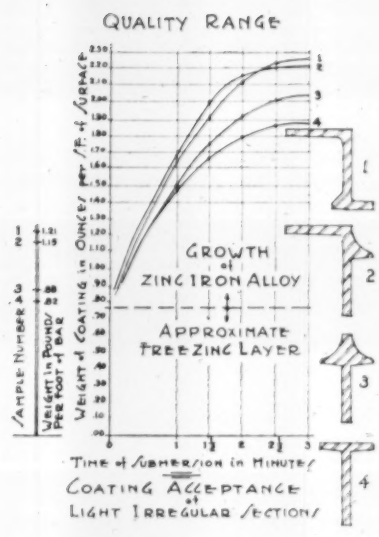

QUALITY RANGE
GROWTH of ZINC IRON ALLOY
APPROXIMATE FREE ZINC LAYER
TIME of SUBMERSION in MINUTES
COATING ACCEPTANCE on LIGHT IRREGULAR SECTIONS
SAMPLE NUMBER
WEIGHT in POUNDS PER FOOT of BAR
WEIGHT of COATING in OUNCES per SQ. FT. of SURFACE

Fig. 1

COMPARISON CHART

	Submersion Time	Weight Coating Per sq ft	Coating Avg.	Thickness Per Cent Alloy	Per Cent Free Zinc
Sample 1	45 sec.	1.7 oz.	0.0027 in.	54	46
Sample 2	15 min.	4.0	0.0070	71	29

A COMPOSITE PICTURE SHOWING ALLOY GROWTH THROUGH TEN-MINUTE CYCLE 125 X

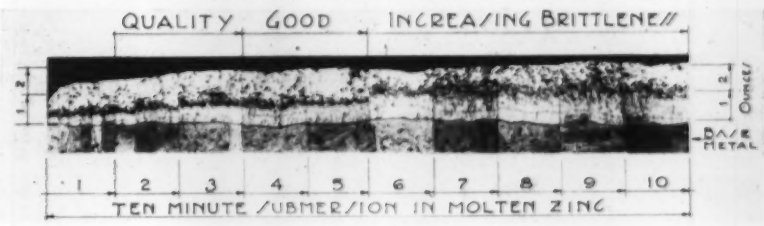


Fig. 2

QUALITY HOT DIP GALVANIZING CHART—LIGHT SECTIONS

QUALITY GOOD INCREASING BRITTLENESS
OUNCES PER SQ. FT. OF SURFACE
TEN MINUTES
ZINC GROWTH and ACCEPTANCE by WEIGHT
DETERMINED by STRIPPING

Fig. 3

tramp particles of alloy did not show in the free zinc layer, excepting where a rough steel surface caused palisading of the crystalline, zinc-iron alloy growth.

Increase in alloy growth was consistent at a decreasing rate, with increase in time of submersion in the molten zinc. The heavier sections produced a greater growth of zinc-iron alloy, with the same time of submersion, and variation between 840 and 860°F had little influence on coating weight.

Longer Submersion — Study of alloy growth over longer submersion times was the next step.

We find (Figs. 2 and 3) grain growth is rapid during the first minute of submersion. This is important since a few seconds either way shows up appreciably in the weight of accepted coating.

Vertical columnar - crystalline growth, which is brittle, slows down rapidly after a minute of submersion to almost no growth at about three minutes—probably due to the increasing resistance of free zinc and base metal to contact each other and the alloy.

At three minutes, the normal alloy growth is apparently complete, uniform and leaves a base for uniform reception of free zinc.

Middle Ground—For the next two minutes of submersion, from 3 minutes to 5 minutes, alloy growth is barely apparent but the quality of the coating remains good. Through this retarded alloy growth zone there is unquestionably some breaking away of the uneven ends of columnar-crystalline growth. They are heavier than zinc and settle to the bottom of the bath to form dross, picking up zinc in their descent.

It is apparent that any reduction in submersion between 3 minutes and 5 minutes will not materially reduce the weight and quality of coating but will reduce dross formation and improve the economy of operation.

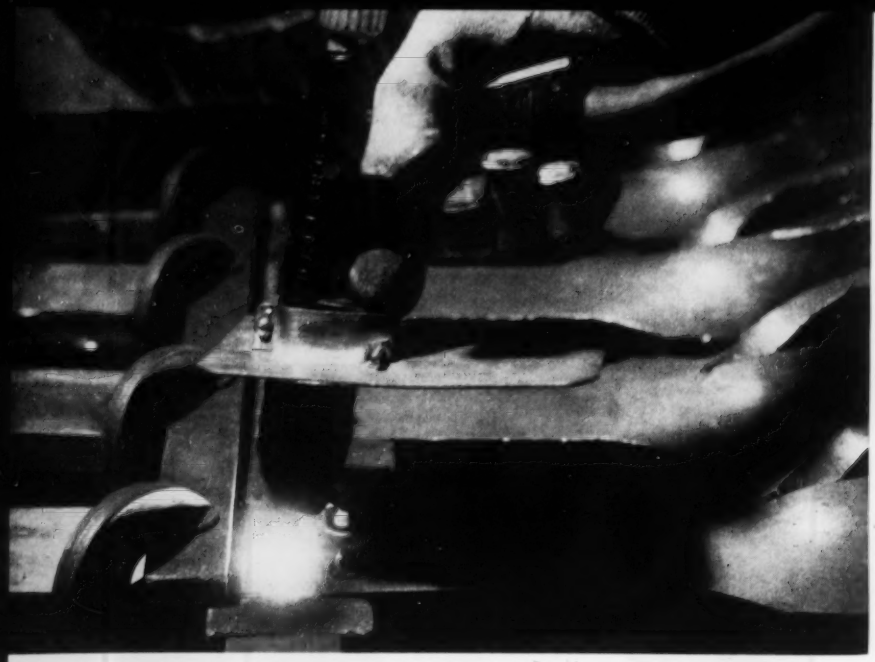
After Five—Increasing the submersion time beyond five minutes shows a rapidly accelerating, zinc-iron alloy growth that tapers off again at about nine minutes to practically no increase. In this range there is a decided increase in tramp particles of the alloy. Trapped by free zinc, they are in the free zinc layer. Particles are much larger than those found with shorter submersions. The indication is that much more dross is formed in the zinc bath in this extended submersion period.

Bars of each submersion period were bent 180 degrees over a soft mandrel. It was found that the radius of the bend increased in approximate direct proportion to the thickness of the alloy growth.

Up to five minutes submersion time, a coating was produced that remained smooth and showed no checking with the bending. At 6 through 10 minutes, coating showed increased wrinkling and checking in the bending. At 10 minute submersion, fracturing of the coating was quite severe.

Fifteen Minutes—To reveal the extreme, test bars were submerged in molten zinc at 850°F for 15 minutes. When bent over the soft mandrel, the coating flaked off in large areas showing extreme brittleness and poor adhesion.

Using this extreme comparison again, two ¾-inch by 3/16-inch steel bars were selected; one was submerged in molten zinc at 850°F for 45 seconds and one for 15 minutes. Coatings were photomicrographed and stripped to find weight of coating (see chart).



LOOK FOR

With the porosity problems well on the way to solution, the inert gas-metallic arc process stands to move more rapidly into fields dominated by coated-electrode welding

SUCCESSFUL production experience with sigma welding was easily obtained with such metals as aluminum, copper and stainless steel. However, welds on carbon steel were of very poor quality until the introduction of oxy-argon mixtures about three years ago. This article may be considered a progress report covering three years of research, development and commercial exploitation of the sigma process as applied to the welding of carbon steel.

Practical Applications—It was believed that higher welding speed and higher arc-time factor attributed to sigma welding would be most valuable on repetitive, high-production types of jobs. So-called job shop welding, where actual arc time is relatively low because of short runs on many items, would not show immediate advantages because of the ratio of consumable material costs to productive labor and overhead costs.

Exploratory trials supported this premise, but also proved that use of the process produced unquestionable cost savings compared to any method where speed and operating factors were important.

Typical Examples—Sigma welding of ship plate in Canadian ship yards has been approved by Lloyds' Registry and the American Bureau of Shipping, using a standard killed welding wire and an oxy-argon mixture. All specifications for physical properties and radiographic requirements were met for butt welds and fil-

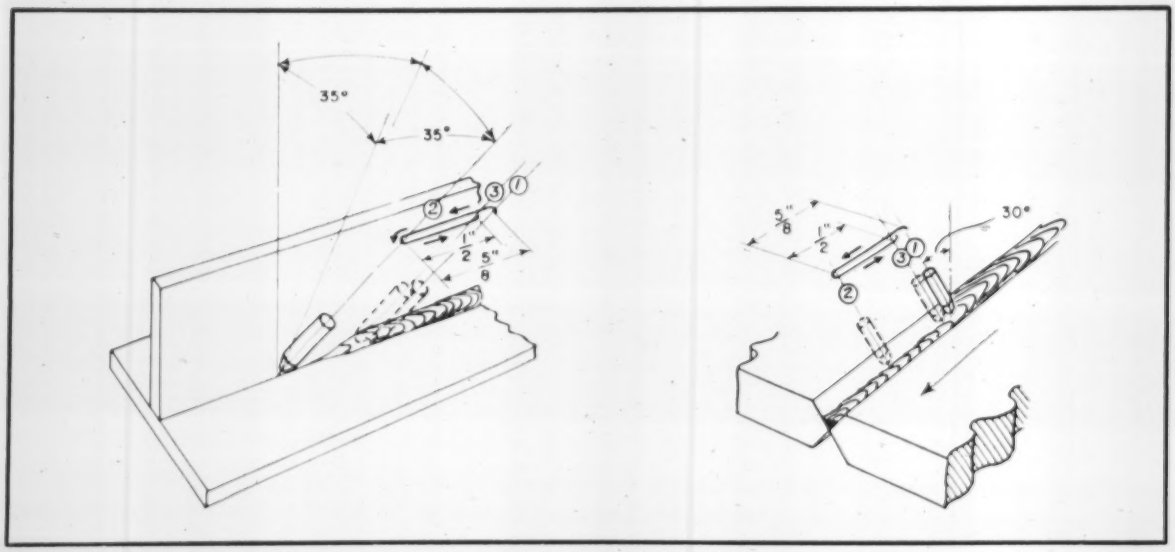


Fig. 2—Whipping technique differs slightly in fillet and butt welds

MORE SIGMA WELDING OF CARBON STEEL

By T. McELRATH and R. T. TELFORD
Development Engineers
Linde Air Products Co.
Newark, N. J.

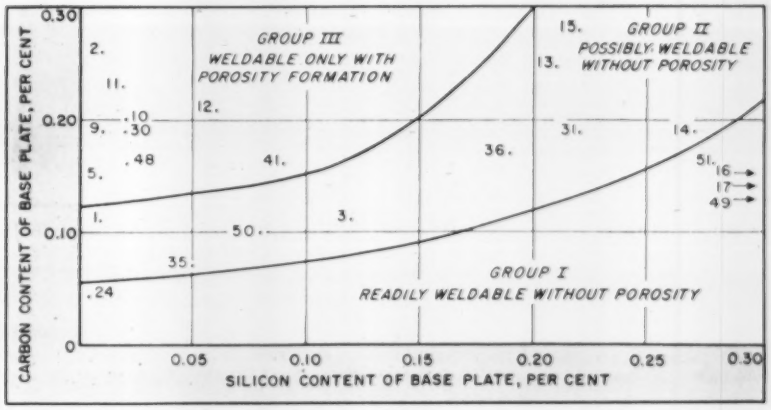


Fig. 1—Relative porosity shows up in plot of carbon vs. silicon content

let welds in ship-quality steel. Similar requirements were met in an American shipyard.

Sigma welding costs on these applications averaged twenty to thirty per cent lower than costs for flux-coated electrode welding, despite higher material costs for filler wire and shielding gas.

A leading manufacturer of automotive parts has employed sigma welding in full scale production during a period of two years. Miles of fillet welds have been made at costs considerably lower than had been achieved previously. Numerous applications have been made successfully on items such as compressor housings and thinner structural members.

Porosity Tests—A large quantity of weld samples was prepared to analyze the effect of carbon and silicon on porosity formation. Approximately seven tons of steel comprising thirty compositions were used in these tests. Butt welds were made in thicknesses ranging from ¼ inch to 1½ inches. Fillet welds were made on ¼-inch thick plate. Welding conditions previously established successfully on production-type jobs were employed.

Radiographic examination of 300 feet of *butt* welds in all steel compositions resulted in a definite correlation of carbon-silicon ratio with porosity. The various steels were divided into three groups, in the order of porosity-forming tendencies in butt welds. The division was made on the basis of average porosity count.

Practical significance of these weldability ratings is illustrated in Figure 1. Three groups of steels are plotted on this chart of carbon vs. silicon contents. Lower area represents Group I steels, considered readily weldable. Group II steels occupy the center range, with porosity acceptability dependent on quality standards. Upper portion of weldability range covers Group III steels, wherein porosity always occurred, usually to a completely unsatisfactory degree.

Fillets Different—The foregoing information pertains only to butt welds. Surface condition of the steel to be joined was the major problem involved in fillet weld quality. Good results could be obtained invariably on pickled or

MANUAL SIGMA BUTT WELDS IN 3/4 IN. STEEL

STEEL	TECHNIQUE	WELDING WIRE	TYPICAL RADIOGRAPHS
GROUP I	NORMAL	KILLED	
GROUP III	NORMAL	KILLED	
GROUP III	WHIPPING	KILLED	
GROUP III	NORMAL	EXPERIMENTAL	

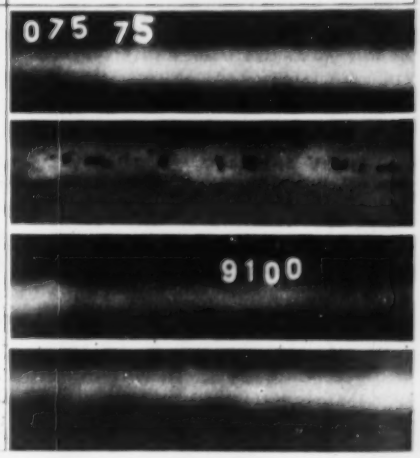


Fig. 3—Typical radiographs of sigma welds under circumstances described

COMPARISON OF POROSITY COUNT

AVERAGE HOLES* PER FOOT

Steel Group Rating	Commercial K Killed Wire	Specially Deoxidized Wire
I	1.0	0.9
II	4.0	0.8
III	19.6	1.1

*Large holes and worm holes

Fig. 4—Porosity figures represent holes 1/16-inch in diameter plus worm holes

sandblasted plate regardless of material composition. Fillet welds made on rusted areas invariably produced porosity, with type and extent depending on plate condition. Worm-hole porosity and visible surface porosity occurred most frequently on heavily scaled plate.

Weldability rating for fillet welds therefore became a simple matter of defining the surface conditions that would permit deposition of acceptable welds. Although the necessity for relatively clean surfaces was a deterrent, it was possible to make good welds consistently under specified conditions as proved by successful field applications.

Nature of Porosity—A carbon-oxygen reaction is believed to be the prime cause for porosity in carbon steel weld metal. This reaction forms carbon monoxide which is trapped in the solidifying puddle. Carbon is present as an element in both the plate and the filler wire. Oxygen is occluded in the plate and wire, and is present also in rust and mill scale on the plate. Gaseous oxygen in the argon-oxygen shielding gas mixture probably exerts some influence.

It is fortunate that oxygen combines less rapidly with carbon than it does with other elements. Silicon and oxygen combine during welding also to form nongaseous oxides, which float to the surface of the puddle. This oxygen-consuming property of silicon accounts for improved weldability in silicon-bearing steels, as has been shown in Figure 1.

An analytical appraisal revealed that five to ten times as much original plate surface is melted in depositing a *fillet* weld in comparison to a *butt* weld. It was concluded that the amount of free oxygen originating from rust and mill scale on the surface was much greater than the amount of oxygen originating from the base plate.

The absence of porosity in fillet welds on cleaned plate shows clearly that the surface rust and scale are the major sources of porosity formation in this case.

What To Do—Changes in technique were investigated for improving the weldability of the Group II and Group III steels. A "whipping" technique proved to be most advantageous by the direct result of lowering porosity markedly in most instances. It differed from conventional manipulation by the rapid torch motion, in forward and backward oscillation along the seam, in combination with a backhand torch angle (Figure 2).

A longer molten puddle results from this technique, and the puddle is agitated vigorously before it solidifies. Apparent cause for porosity reduction on butt joints was release of trapped gases from the puddle before solidification occurred, through comparatively violent agitation of the puddle.

Wire Development—The carbon-oxygen reaction theory suggested an obvious line of attempting porosity reduction through addition of deoxidizers to the puddle. Best method of adding a deoxidizer to the puddle is to alter the chemical composition of the filler wire.

Many trials in adding deoxidizers to the welding wire were finally rewarded by development of an entirely new experimental steel wire composition. This specially deoxidized wire suppresses porosity formation significantly, without affecting the puddle otherwise to any noticeable extent. All of the steel grades previously tested in the weldability program were rewelded with the new wire. Decided quality improvement was recognized in fillet welds on uncleaned plate, and in butt welds made in the Group II and Group III steels.

Good Results — The porosity comparison table (Fig. 4) shows little difference between the killed wire and the experimental wire on Group I steels. On Group II steels porosity increases noticeably with the killed wire but remains substantially the same with the special wire. The greatest difference is shown in Group III steels, where some 19 large holes per foot were encountered with the killed wire but the porosity count remains at a very low level with the experimental wire.

Figures shown in this table represent the total count of holes larger than 1/16-inch diameter, plus worm holes. The same ratio applies for smaller holes. Code acceptance can be met in Group I steels and sometimes in Group II steels, with the killed wire, and in all three groups, with the experimental wire. All of the foregoing discussion is based on the use of normal welding techniques. The knowledge gained on the values of special deoxidations has not yet been applied to commercially available wires.

Figure 3 illustrates typical radiographs. The top weld is typical of that being obtained daily on Group I steels with normal techniques and a killed wire. The second weld shows the result on a Group III steel. The third and fourth welds were made in the same Group III steel and show the benefit gained by use of the "whipping" technique and the experimental wire.

From a paper presented at the Annual meeting, American Welding Society, Fall, 1953.

A PINCH OF BORON... Doubles Yield Point of Low-Carbon Steel

Combination of 0.5 per cent molybdenum and as little as an ounce of boron turned out to be the right one for a high-tensile, readily weldable steel

FORTIWELD COMPOSITION

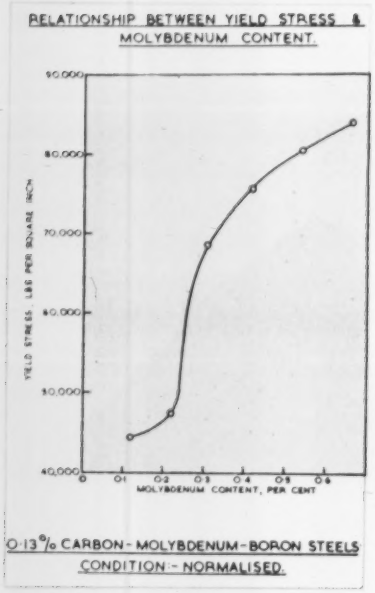
	%
Carbon	0.14 max.
Manganese	0.60 max.
Silicon	0.40 max.
Molybdenum	0.40/0.60
Soluble boron	0.0015/0.0035
Sulphur	0.05 max.
Phosphorus	0.05 max.

MORE by accident than calculation did researchers of United Steel Companies Ltd., Sheffield, England, discover that when molybdenum and boron were present in certain proportions in low carbon steel the yield point was doubled without necessity for heat treatment. Aptly named "Fortiweld," the new steel has a tensile strength of 80,000 psi combined with an ease of welding common to low-carbon steel.

As little as one ounce of boron, when added to a ton of steel containing 0.40 per cent molybdenum, is sufficient to give these pronounced improvements in properties.

Previously, alloys having the desired strength properties were very difficult to weld. In addition to its strength at ordinary temperatures, Fortiweld possesses good properties at 450 to 500° F, withstanding service stresses two to three times those permissible for mild steel.

Putting It To Work—Various user trials have been made or are in progress. So far, Fortiweld's widest appeal has been its weldability. It is stronger than any steel that will weld as readily and can be used as-rolled or simply normalized. Bridge designers, as a result of trials, are satisfied that the substantial saving in weight and freedom from difficulties in welding offered by this steel justify its use, especially in field-assembled bridges for the military. In this



application, steel sections are used in the as-rolled condition.

Aircraft engine makers in England are making extensive trials in the form of sheet and rings for structural members and air casings.

One firm has even adopted it for standard production models. Its use is mainly to reduce weight and replace stainless sheet and rings and aluminum alloy castings. Test results recently obtained on cold drawn and tempered tubes indicate that Fortiweld will have many advantages over carbon-manganese and carbon-chromium-manganese steels used presently for engine mountings.

Civil Jobs Hazy—Adoption of the steel for civil applications is dependent largely on the availability of moly. Fortiweld has already been used for high tensile rivets where freedom from hardening on air cooling of the heated head is an essential.

Other suggested applications are cranes, jibs, pressure vessels, high pressure piping, compressed gas cylinders, high strength oil casing, railroad freight cars and special automotive trucks. Developments in these and other applications are expected to receive attention when the moly situation improves.

Welding Details — Fortiweld shows no hardened zone crack

HERE ARE RESULTS OF KAISER STEEL CORP.'S WORK WITH MOLYBDENUM-BORON STEEL

Typical chemical and physical properties of an open-hearth heat produced at Fontana and rolled into various sections.

Chemical Analysis

C	Mn	P	S	Si	Mo	B
0.08	0.39	0.022	0.033	0.21	0.49	0.0012

Physical Properties

Section		Yield Strength psi (0.2% offset)	Tensile Strength psi	% Elong. 2"
As-rolled 4" x 4" x ⅝" angles	L	70,050	78,100	25
As-rolled ⅞" plate	T	70,340	82,860	23
	L	73,670	82,800	25
As-rolled ⅝" plate	L	67,800	79,000	36
As-rolled ¾" plate	T	67,330	78,000	34
	L	62,220	77,000	25

T—Transverse test specimen L—Longitudinal test specimen

Impact Properties

Charpy Keyhole specimens from ⅝" normalized plate (longitudinal samples)

Temperature °F.	Energy Absorbed Ft. Lbs.
0	52
—40	45
—80	40
—100	30

⅝" Plate—As-rolled—Longitudinal Section

Temperature °F.	Energy Absorbed Ft. Lbs.
+70	34
+32	33
0	23
—40	20
—50	21
—60	21
—70	20
—80	12
—90	8

*Note: While the impact properties quoted above on the normalized and as-rolled plate are very good, it must be taken into account only one heat is represented; consequently impact properties cannot be guaranteed.

The following properties were obtained from ¾" and ½" plate rolled from an ingot which had been treated with molybdenum and boron.

Chemical Analysis:

C	Mn	P	S	Si	Mo	B
0.08	0.46	0.009	0.031	0.22	0.44	

Physical Properties:

Section		Yield Strength psi (0.2% offset)	Tensile Strength psi	Elong. % 2"	% Red. Area
As-rolled ¾"	L	71,500	90,000	27	57.5
Plate machined to 1" x ⅝" samples	T	73,000	89,800	26	53.5
As-rolled and normalized at 1700° F.	T	71,500	84,000	25	68.8
Stress relieved at 1100° F.—0.505" test bar	L	73,000	83,500	22	62.6
As-rolled and normalized at 1900° F.	L	71,000	86,000	24	64.0
Stress relieved at 1100° F.	T	70,500	86,000	21	68.4
½" plate	L	71,100	89,500	28	58.8
As-rolled	T	70,500	89,000	28	58.0
As-rolled and normalized at 1700° F.	L	71,000	84,000	32	
Stress relieved at 1050° F.	T	70,000	86,000	29	
As-rolled and normalized at 1900° F.	L	70,000	86,500	28	
Stress relieved at 1050° F.	T	71,000	87,000	28	

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than any other A. C. welder

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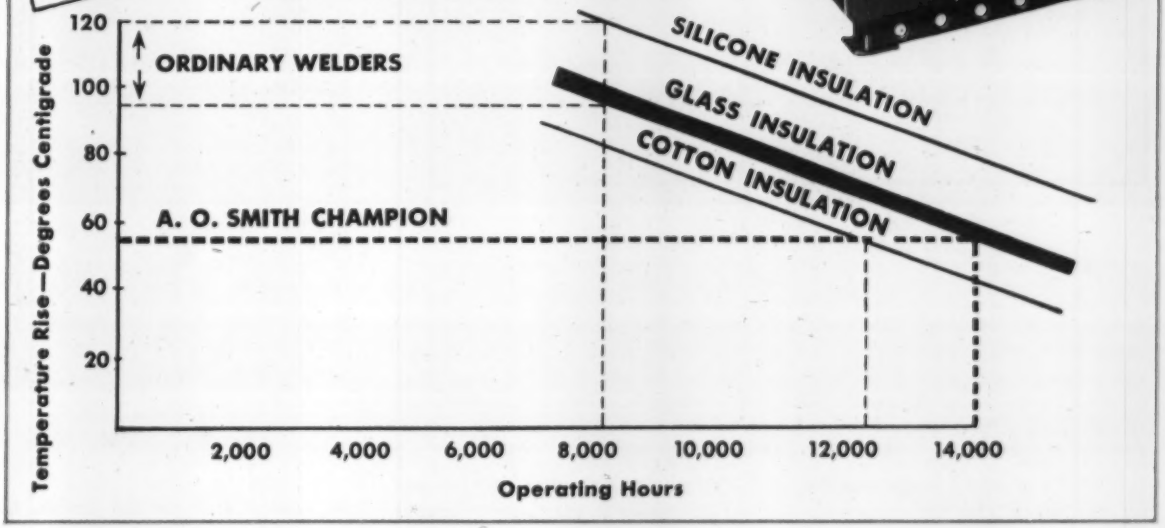
PROOF

LIFE EXPECTANCY CHART



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The A. O. Smith Champion is the *only* A. C. welder on the market with enough copper and cooling capacity to operate without exceeding a 55° C. temperature rise—as compared to the 90° C. rise allowed by N.E.M.A. for glass-insulated welders.

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MECHANICAL PROPERTIES

Material: ⅝-inch diameter forged bar
Heat Treatment: 930° C A.C. (1706° F)

Quality:	½% Mo	½% Mo with boron	Mild steel	Mild steel with boron
Ultimate tensile stress, psi	63,800	91,800	59,400	57,800
Yield stress, psi	36,300	*78,000	42,000	38,300
Elongation on 4 √A, %	40.0	26.0	44.0	41.1
Reduction of area %	74.0	71.3	72.0	73.6
Izod impact value, ft. lb.	99	93	94	96

* This corresponds to 1.0 per cent extension on 2 inches, no true yield stress existing

NOTCH TEST PROPERTIES

	Fortiweld Normalised		Fortiweld As-rolled		0.35% Carbon Normalised	
U.T.S. psi	90,300		100,300	102,400	92,300	
	Plain P	Notched N	Plain P	Notched N	Plain P	Notched N
Limiting fatigue stress (LFS) ±psi	53,800	28,600	56,600	35,800	42,100	16,800
Fatigue ratio LFS/ Fatigue ratio LFS/U.T.S.	0.60	0.32	0.57	0.35	0.45	0.18

Fortiweld steel shows marked superiority over the plain carbon steel both in the absence and in the presence of a notch. The lowering of the fatigue strength, due to the stress raiser, was much more marked in the case of the plain carbon steel

susceptibility. Reeve fillet weld tests have been made on 1-inch thick plate, cooled to 0°C before welding, with class E 6012 electrodes 5/32-inch in diameter without cracking. Same tests using E 6010 or E 8010 electrodes also do not show cracks.

Single pass welds on ½ and 1-inch plates to obtain full quenching effect give maximum values of about 300 D.P.N. depending on carbon level, but seldom exceeding 350 D.P.N. A fair amount of ductility is obtained in the hardened zone, as proved by test. Angles of bend at start of fracture of about 50 degrees have been obtained at room temperature.

Welding Processes—The usual sheet metal welding processes, with exception of oxy-acetylene welding, are suitable. Metal arc or argon arc do not produce a softened zone like oxy-acetylene does. To a lesser degree, atomic hydrogen welding promotes loss of weld strength, too.

In using the argon arc process, a fully-killed steel is essential. Composition regarded as satisfactory is 0.3 per cent carbon, 1.5 per cent manganese, 0.3 per cent silicon. If metal arc welding is to be used, electrodes should be mild steel or low alloy steel with rutile or lime-spar coatings. Oxidizing coatings are considered unsatisfactory.

Spot welds with adequate toughness can be made without special precautions, peel tests failing at the weld slug-sheet metal junction zone.

Two-Truck Fleet

TWO MATERIALS handling trucks, manufactured by Automatic Transportation Co., Chicago, withstand heavy demands made on them at Love Brothers Foundry in Aurora, Ill. The Transporters, operator-led, electric platform trucks, operate on a round-the-clock basis, almost without let-up.

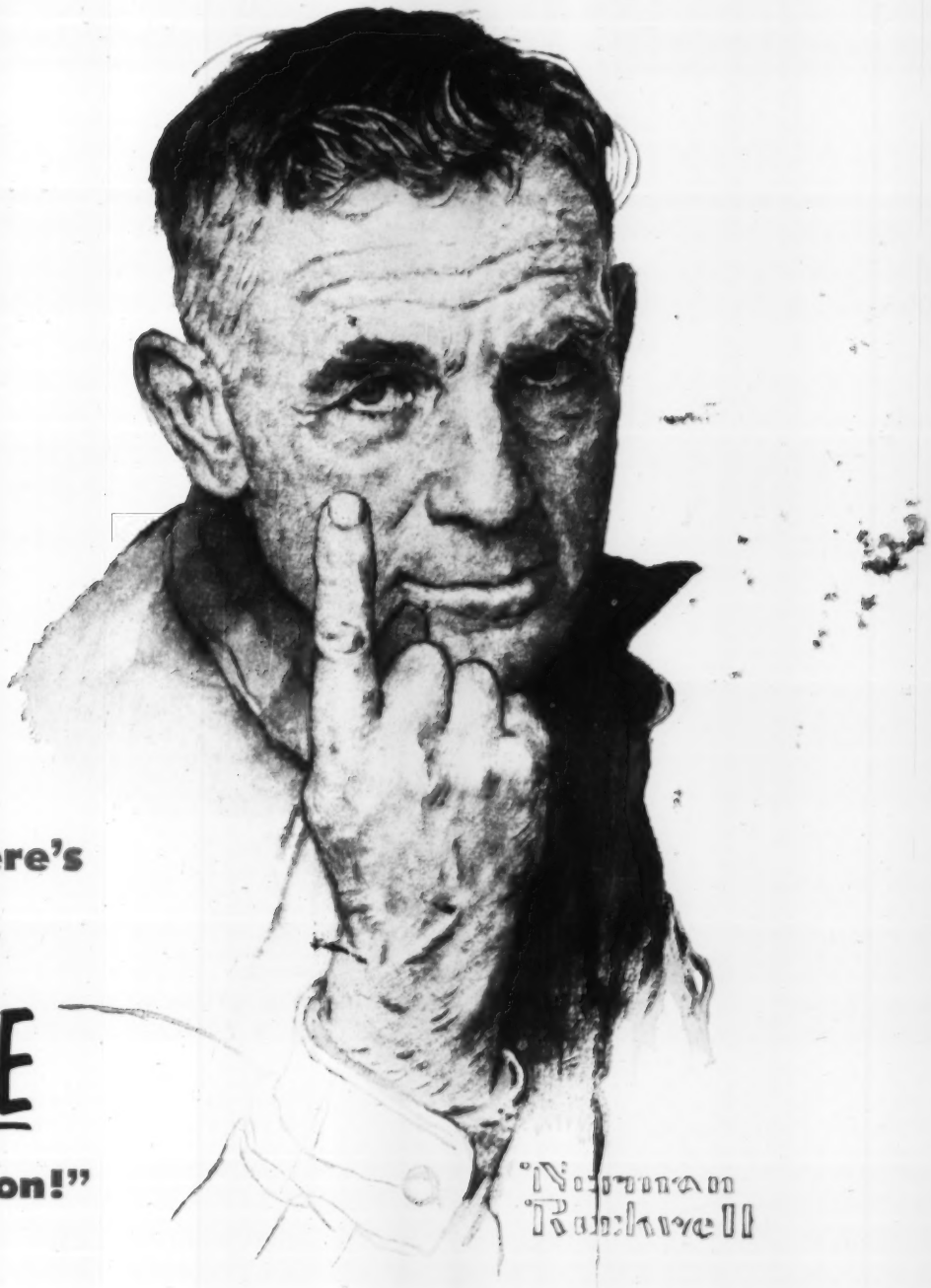
Trucks are used in this manner: They haul prepared molds into which hot iron will be poured, from the mold room to drying ovens for baking, then back 100 feet to an assembly room where molds will be closed and prepared for pouring. During this time another truck may be hauling core sand from a muller, where special sand is processed, to the core room, a distance of 200 feet. Here, sand is baked and dried to form an interior mold.

Schedule — These operations usually are done during morning hours. In the afternoon, pouring

FASTER HANDLING
. . . molten metal moves 100 feet

of molten iron in the molds begins. A Transporter waits at the cupola with a ladle in its own cradle weighing 1000 pounds. Every 7 minutes the ladle is filled with 2500 pounds of molten iron. The complete load, weighing 3500 pounds, is transferred 100 feet to the pouring area.

The still-hot castings are removed and placed on metal skids, hauled by the Transporter to a cleaning room. After cleaning they are then handled by lift trucks or cranes.



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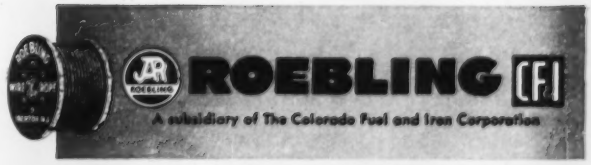

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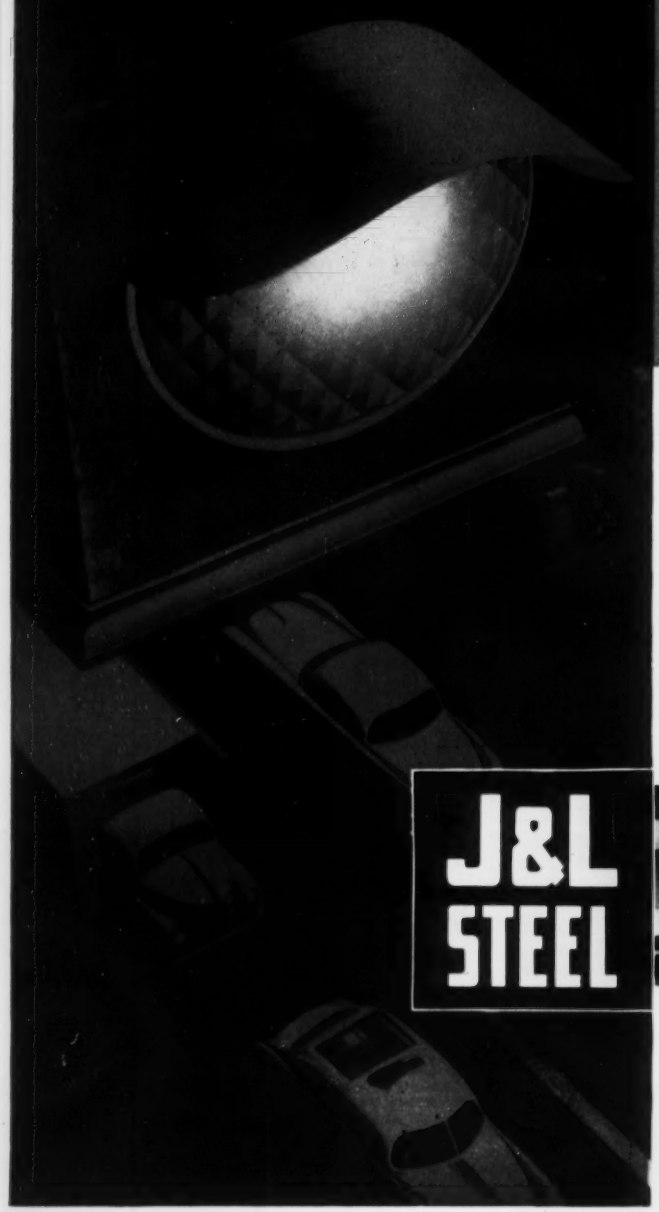

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- good heat-treating properties
- high cold-drawn physical properties
- wide range of applications

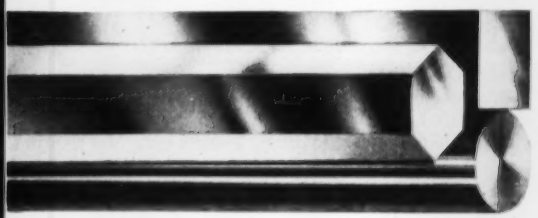
Jalcase was developed in J&L's metallurgical laboratories to meet the need for a free-cutting open-hearth steel with the mechanical properties required for high quality machined parts.

Today, specifications are standardized within the steel producing industry and S.A.E. and A.I.S.I. numbers have been assigned:

LOW CARBON GRADES		HIGH CARBON GRADES	
Jalcase Designation	A.I.S.I. Number	Jalcase Designation	A.I.S.I. Number
Jalcase—1	C-1113	Jalcase—7	C-1137
Jalcase—2	C-1114	Jalcase—8	C-1141
Jalcase—3	C-1116	Jalcase—9	C-1144
Jalcase—4	C-1117	Jalcase—10	C-1144 specially processed
Jalcase—5	C-1118		
Jalcase—6	C-1119		

And, J&L's Jalcase continues to maintain leadership in this group of steels.

J&L STEEL



When you specify "JALCASE," you can depend upon those qualities that help you obtain better production . . . longer tool life . . . lower overall costs. Remember to say "JALCASE" when you order.

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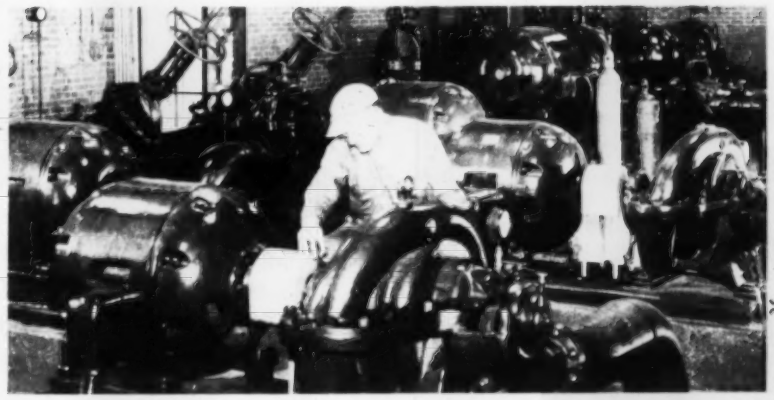
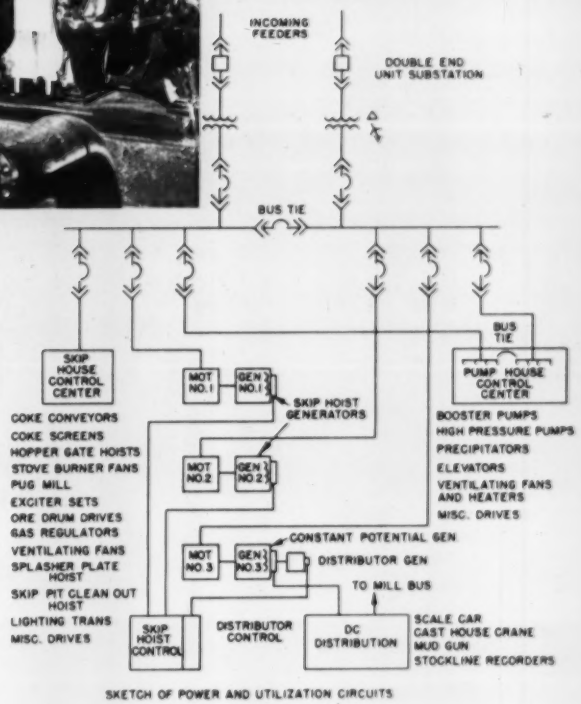


Two pump drives, above, are practically separate systems which can be changed through the bus tie in the motor control center or at the load center

Circuit, below, makes use of two independent incoming feeders connected to a double-ended load center unit located in the skip house, convenient for needed circuit switching



SKETCH OF POWER AND UTILIZATION CIRCUITS

INTEGRATED ELECTRICAL SYSTEM . . .

Heart of the Modern Blast Furnace

Electrical failure can be costly in production and furnace damage, so planning the system with extra muscle is vital. Here's a typical installation

By C. P. HAMILTON
General Electric Co.
Schenectady, N. Y.

ELECTRICAL equipment required for the modern blast furnace has become so comprehensive, and the operation so automatic, that the reliability of the whole system from the power sources to the utilization components is extremely important.

To achieve this requirement, which is equally desirable for all of the essential drives, makes it necessary to start at the power source and carefully examine each component right down to the drive itself.

Two Feeders — Circuit shown makes use of two independent incoming feeders connected to a double ended load center unit located in the skip house which is a convenient location for any circuit switching that may be necessary. The importance, to this point, is that the source of power to the feeders is as adequate as practicable and that the feeders are provided with circuit breakers of ample interrupting capacity, well installed and protected against damage.

Load center will usually contain electrically operated breakers for full voltage starting of the hoist and constant potential motor-generator sets to simplify the starting equipment while manually operated feeder breakers are used in the circuits to the motor control centers.

A similarly constructed metal-enclosed unit with draw-out breakers is provided for the constant potential generator and the feeder circuits to the scale car, transfer car, cast house crane, the mud gun, the distributor when operated from constant potential, and the stock line recorders.

Power Users—When it is realized that the number of individual power utilization units required for blast furnace operation can easily approach 50 or more, the need for a well co-ordinated motor control system becomes apparent. The use of group assembled control centers appears to be a logical answer.

Such units permit co-ordination of the control for selected groups of drives and for dividing the drives into essential and nonessential categories for circuit segre-

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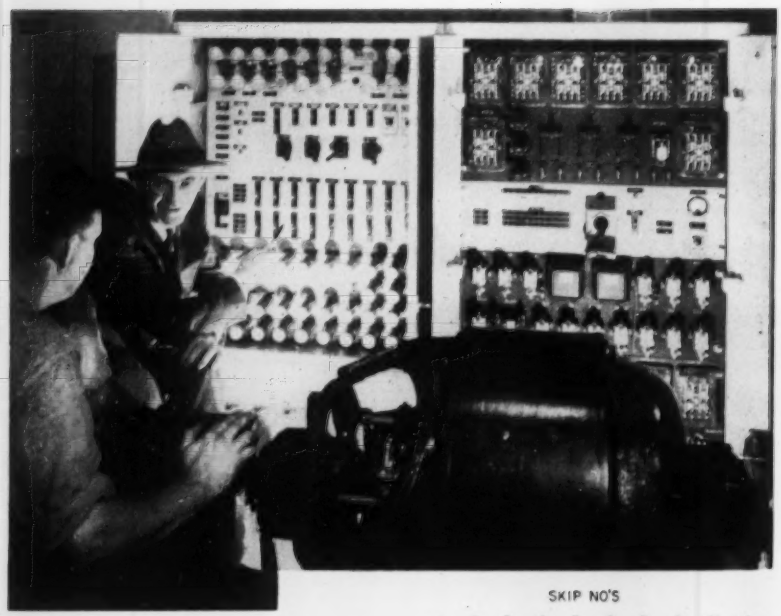
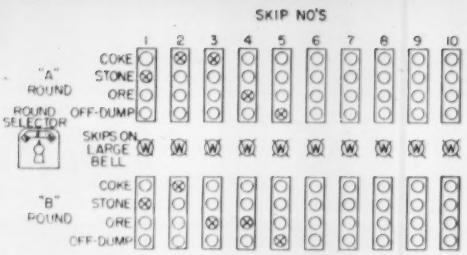




Charging sequence is set by pressing buttons in the order that loads are to be delivered. Selector switch permits delivery of alternate charge rounds

gation in the distribution system from the load center. Use of the proper type of air circuit breakers, or of high interrupting capacity fuses, gives adequate circuit protection and localizes faults.

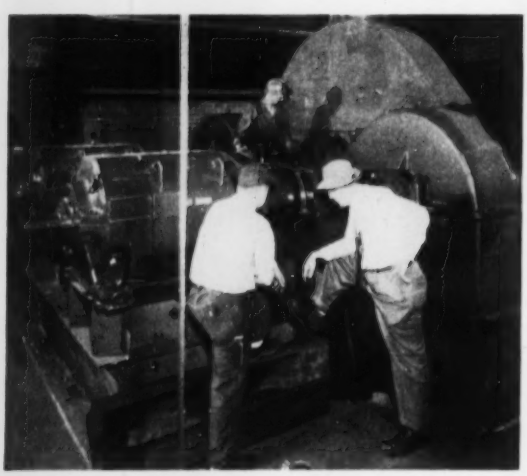
Grouping of the controls into metal-enclosed centers with lockable doors and with air circuit breakers and switches, operated externally, reduces installation and maintenance expense, and minimizes the hazards to operating personnel. The control equipment is well protected from dirt and construction hazards, particularly during installation, and from the gases that are so prevalent after the furnace is put into operation.

Essential Drives — Damage to the furnace can quickly result if the water supply is interrupted for more than a very few moments. Power distribution circuit should include two feeders from the load center connected respectively from each transformer bus to the pumphouse motor control center which also includes a split bus arrangement. Thus, the two pump drives shown are practically separate systems from the pump to the incoming feeders with provision to change feeders through the bus tie in the motor control center or at the load distribution center.

Second in the category of essential drives is the skip hoist operating system. While no damage necessarily will result if the hoist operation is briefly held up, continuity of operation is extremely important, and ample provisions to keep the hoist in service with a minimum of outage time are well justified.

Here's How—The provisions for assuring continuity of operation of the hoist include:

1. Two duplicate motor-generator sets, each fed from the individual buses in the load center, thereby permitting operation of the hoist from one motor-gener-



Hoist is driven by duplicate mill-type motors connected in series-loop circuit with two generators. One motor can run it at 75 per cent speed

TAKE THESE PRECAUTIONS

1. Pressurize the skip house.
2. Use cabinet-enclosed control equipment.
3. Use filled commutator risers for the generators. This prevents accumulation of carbon dust due to brush wear, often aggravated by the fumes from the slag pit.
4. Provide clean filtered air to the machines.
5. Use indicator lights to show the operating condition of machines, particularly those that are extremely important in the operation of the equipment. In other words, if a machine happened to shut down for some reason or other, it is advantageous to the maintenance personnel to be able to detect quickly which of the machines has shut down.
6. Use fault finding devices to search out or indicate open circuits, particularly those in interlocking circuits.

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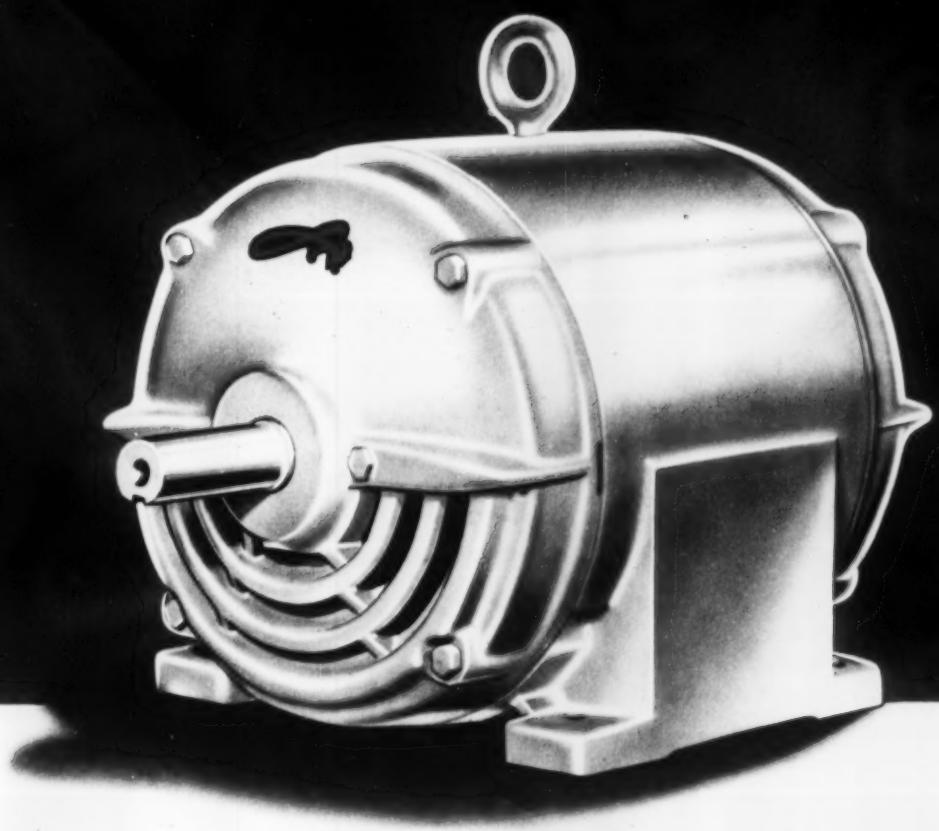

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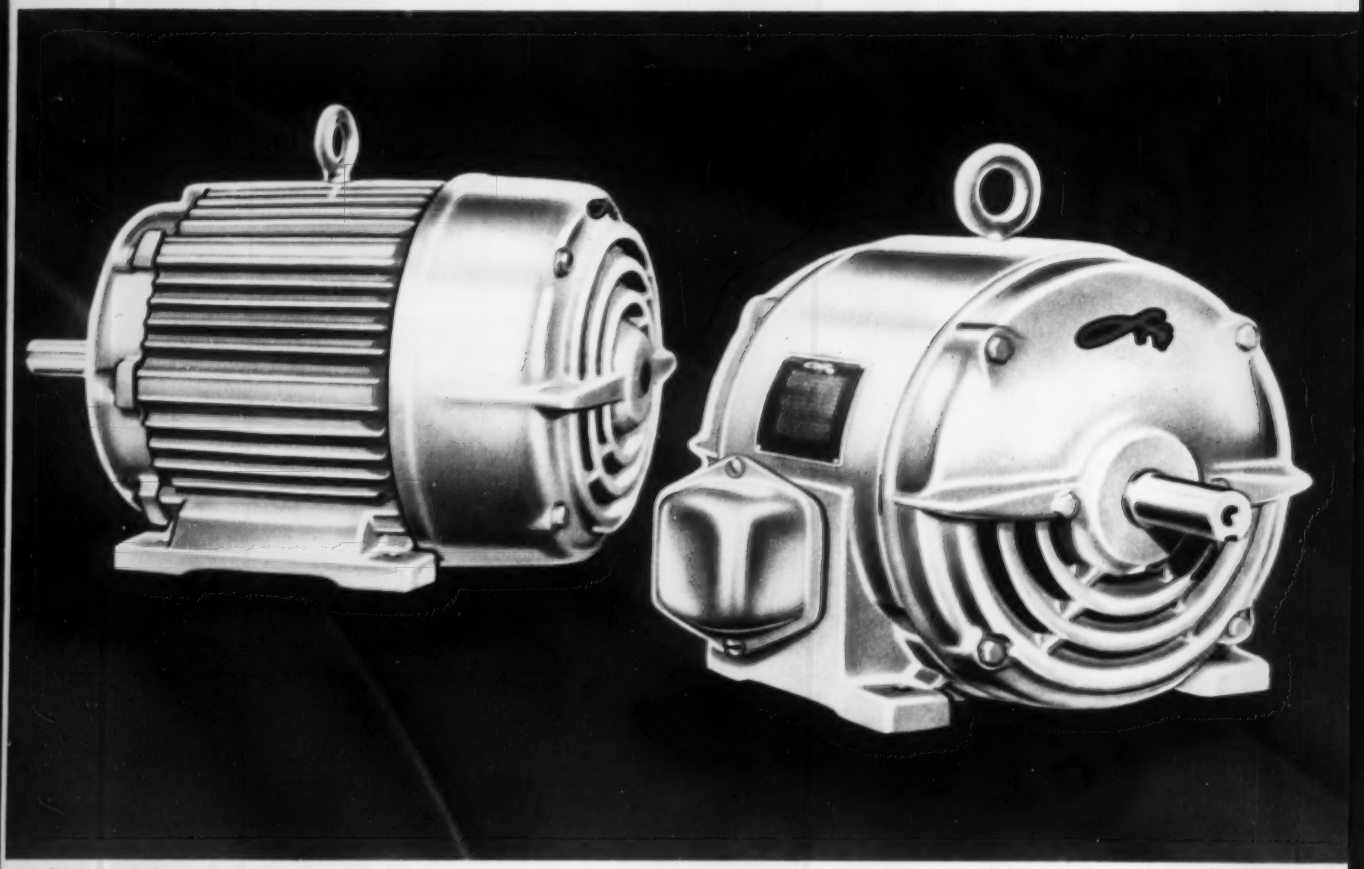

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ator set in case of a feeder failure, starter failure, or a driving motor failure.

2. The hoist is driven by two duplicate mill type motors connected in a series loop circuit with the two generators, with switching that quickly permits a selected hoist motor and generator to be taken out of the circuit. This permits running the hoist at approximately 75 per cent of normal operating speed with the skips carrying the rated loads. "Forcing" of the motor shunt field excitation obtains the high torque per ampere of armature current required to permit single motor operation without using unnecessarily large machines.

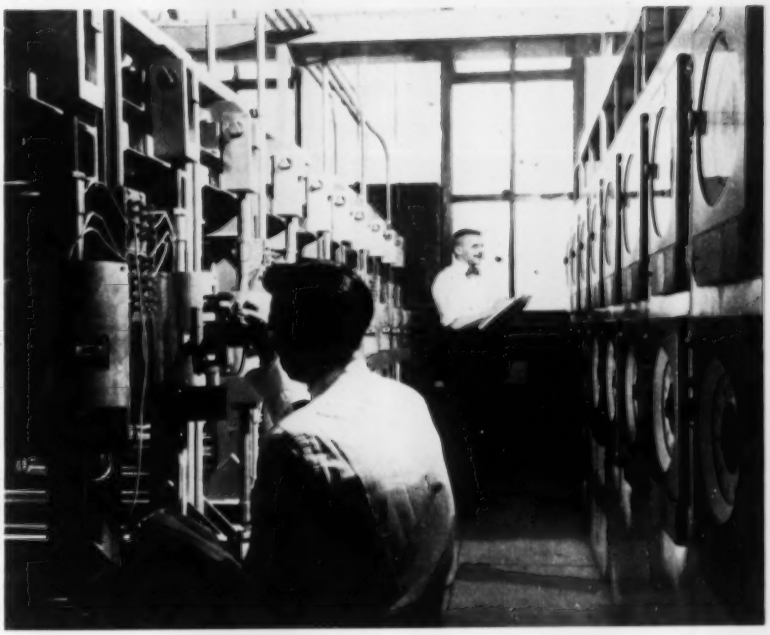
Added Advantages—This flexibility of the hoist system, which permits operation as long as an ac power source is available, largely eliminates the necessity of making provision for operating the hoist from the dc mill bus since complete failure of the ac sources would shut down the pumps, requiring the operation of the furnace to be quickly curtailed.

In examining the electrical system for hoist operation further for possible vulnerable points, it will be found that the excitation system for the hoist motor and generator fields, for operation of the brakes and control devices, requires careful attention. Unless everything that affects continuity of operation is considered, the objective is defeated.

Program Control — Use of a program control system for the modern blast furnace now seems to be an accepted necessity since it largely eliminates the human element in preserving the charging sequence and loading, as well as saving labor.

The installation shown in the accompanying photo includes a somewhat different type of program control and distributor operation than has been heretofore used, although accomplishing the same end results.

Heart of such a system is largely in the devices used for counting and programming; and for this particular system stepping relays were used of a type similar to those found in telephone exchanges, except of industrial design.



Metal Creep Studied

Seen above is a section of Allis-Chalmers Mfg. Co.'s creep test laboratory where study of metal creep at high temperatures is under way. Full data on creep characteristics of many newer alloys are not yet available. Much study and experimentation must be done before each new alloy is used in higher temperature turbines. Stresses and temperatures in cylindrical furnaces are precisely controlled, periodically measured with micrometer microscope

Long Life—This type of relay has a record for unusually long life and reliability, and, in fact, its use for blast furnace programming dates back to the late 1930's. Of particular interest to the operating personnel of the blast furnace is the simplicity of setting up the round-charging combinations.

There are two series of push button stations, one for the "A" round and the other for the "B" round. To set up a particular sequence, these buttons are pressed in the order that the respective loads are to be delivered. In other words, if the round sequence calls for a stone load followed by two coke loads, and then an ore load, it is simply necessary to push No. 1 button for the stone load, No. 2 and No. 3 buttons for the coke loads, and No. 4 button for the ore load, and dump button No. 5 is pressed to end the round.

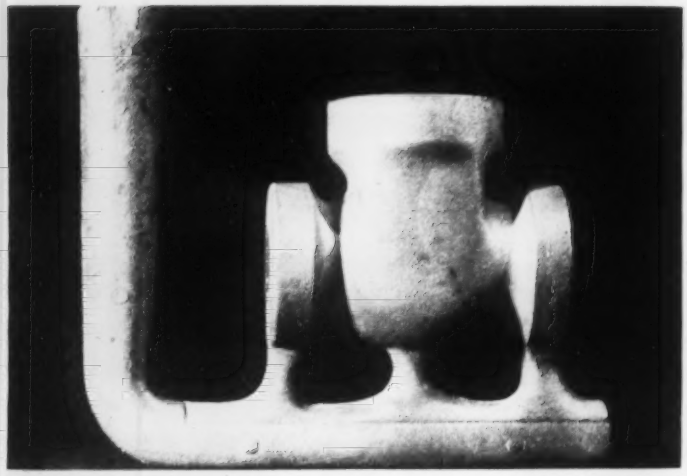
A round selector switch is provided which permits alternate rounds being delivered to the distributor in sequence, or either the "A" or the "B" rounds can be individually used.

Relay Checks—Recognizing also that at some time in the operation it will be necessary to check the stepping relays or the memory relays, provision has been provided to include a spare relay of each type on the panel. These relays are connected by an Ampanol type of plug so that they can be quickly removed from the circuit and the spare relay put into its place.

Panel includes a checking section so that the replaced relay can be quickly plugged in and indicator light up for each circuit and each position of the stepping relays.

An ammeter also indicates whether or not the coil is defective. Basic circuits and relay combinations were worked out by John Mohr & Sons in collaboration with Mr. J. C. McCurley, of Patterson-Emerson-Comstock Co.

From a paper presented at the Fall meeting, Association of Iron and Steel Engineers, Pittsburgh.



This valve was cast by the shell-mold process. Relatively smooth finish is typical. Use of a separate core often is eliminated

ECONOMICS OF SHELL MOLDING

Rule of thumb: If casting can be made fairly easily with a resultant machine-shop saving, the method is advantageous. Savings help pay cost of initial experience

By LYLE L. CLARK
Supervisor, Foundry Section
Armour Research Foundation
Chicago

"SHALL I give shell molding a try?"

Before the foundryman can answer this question firmly, he has several blanks to fill in: Can his castings be converted to the system? Are his customers interested or must he find new ones? Does the physical layout required fit into existing facilities? And how do costs compare with current methods?

As a general rule, if a casting lends itself to the process and if there is a saving in the machine shop, shell molding is definitely advantageous. Savings realized will help write off the cost of experience that must be gained.

Materials—Consensus is that the green sand method is cheaper than shell molding. This has been backed by the argument that resin costs are too high; however, there is some relief in sight on this count. Binder producers recently reduced cost to the customer materially.

Another point is that shell molding should not be compared on sand costs alone. The higher initial cost is partially offset by the simpler warehousing of two-component shell sand. It is not uncommon for the average foundry to stock up to nine items for the formulation of green sand.

Great difference in the volumes of sand handled in the two methods also is a compensating factor. This is due to the more favorable sand-to-iron weight ratio of the shell process.

Labor—Labor supply is a critical problem with many foundries, but this is not true with shell-making equipment that does critical steps automatically. This permits controlled mold production with unskilled labor; and there also should be a reduction in labor cost and scrap losses from molding errors. Light work involved, as compared to traditional heavy work, also pays off here.

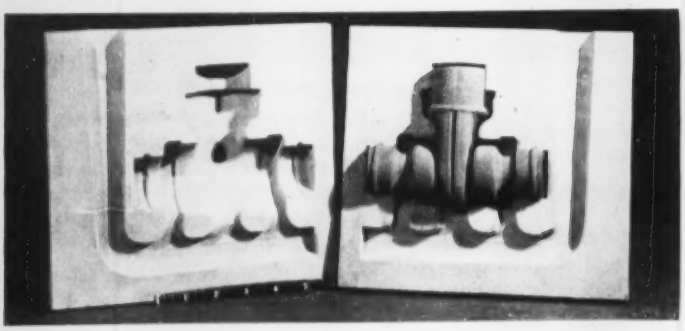
Production—With shell molding, it may be possible to bypass use of a separate core. Forming half the length of the core as part of the shell is common in the case of holes. Sharp contours and recesses also are frequently incorporated. Because of the greater strength of core and shell, if cores are used, crush resulting from core setting is no longer a problem.

Cleaning room costs are generally cut by improved surfaces. Grinding time is trimmed with the disappearance of drop-outs and burn-ins; and extensive milling or blasting should no longer be necessary.

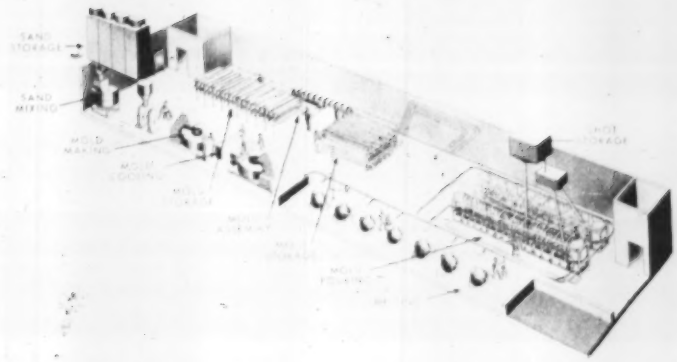
Use of shell molds reduces weight of castings by permitting much smaller tolerances, and, usually, less metal for the gating and risering system—thereby increasing yield. Some change in the cost of melting accompanies higher yields.

Problems—Accuracy is a reflection of pattern equipment used. Since the resin shell is such a close replica, error can be double when a single plate is used for both halves of the mold.

Backing or support of shells still causes trouble. If shot or other material is used, there is a problem of separation and handling at the shakeout station. However, recently developed techniques for glueing shells may obsolete some of these difficulties.



Metallurgists at Armour Research Foundation, Chicago, used these experimental shell molds to cast valves with special alloy properties



Walworth Co.

Mechanization, wherever possible, is the theme of this foundry. The conventional green sand layouts require more plant space

DESIGN FOR SHELL MOLDING

Mechanized foundry is built around automatic shell molding machine that can turn out 240 molds an hour. Extensive conveyor system links stops along the line

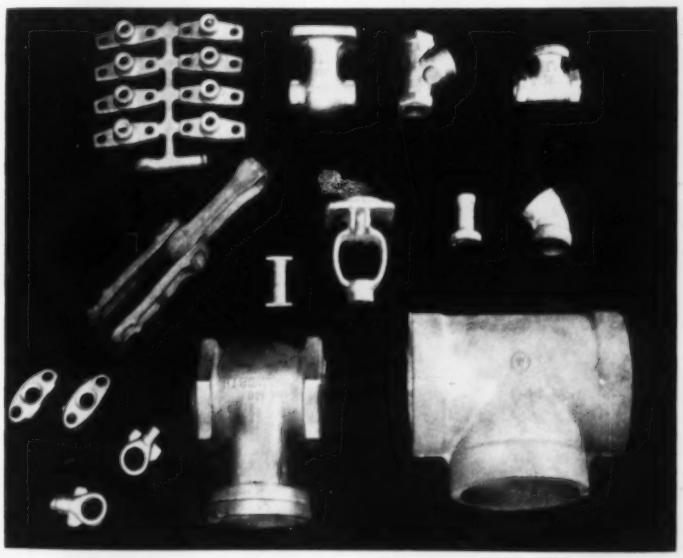
MORE PRODUCTION from less plant space is the promise of a mechanized foundry that centers around an automatic shell mold making machine with a potential of 240 molds an hour.

Originally designed by Walworth Co. to replace its green-sand, bronze foundry at Boston, the commercially-available unit includes sand and resin mixers, the shell molder, mold assembly, melting and pouring equipment. System is integrated by conveyors.

Boston plant can mass produce valves, threaded pipe fittings, pipe flanges and other products cast in bronze, carbon steel, stainless steel, aluminum, brass and other alloys.

The Line—Formula mixture of sand, phenolic resin and wetting agent is blended in mixers next to the mold-making machine. Mixture slides to the base of the machine, where it is handled by a skip hoist.

The rotary mold machine automatically controls eight stations that can take eight mold patterns at a time. Three stations pre-heat the pattern, three cure the mold and one has machinery for pouring the resin-sand mixture. At the last station, a completed mold is automatically ejected every 15 seconds.



Plant can mass produce valves, threaded pipe fittings and pipe flanges cast in bronze, carbon steel, stainless, aluminum, brass

Pattern plates are 16 by 28 inches and can be used to form both halves of a complete, 14-by16-inch shell mold.

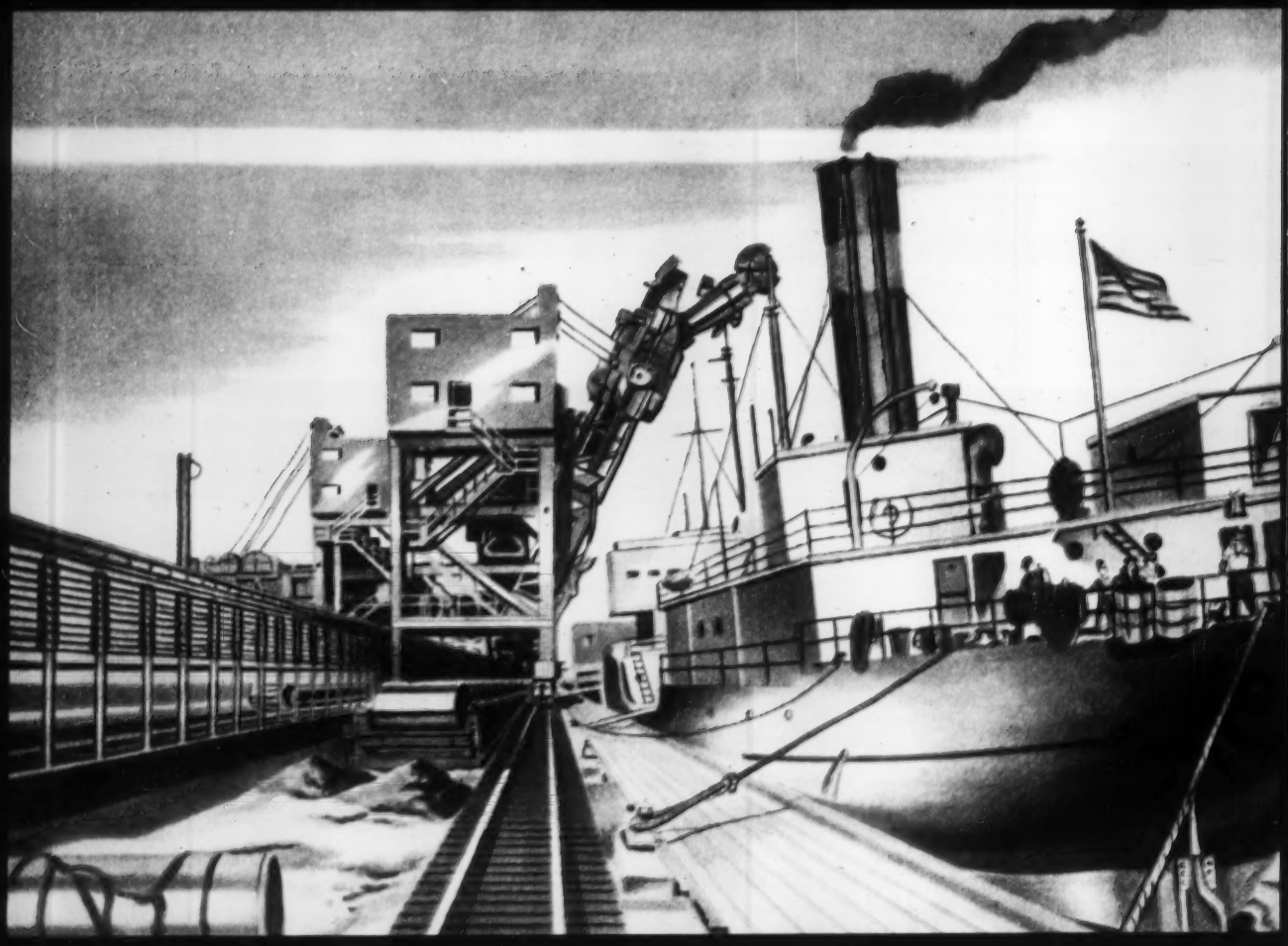
Next Step—Mold shell is manually placed on a transfer conveyor for delivery to an automatic storage conveyor next to the core-setting and mold-closing machine. Mold is cooled in transit.

After cores are inserted, two halves of a complete mold are placed in the mold-closing machine. Adhesive is applied to edges of one shell and the mating shell is placed over it. Closing machine automatically applies uniform pressure over entire mold. Completed molds go by conveyor to automatic storage racks or direct to the pouring machine.

Pouring — The continuous-belt pouring machine travels about 6 feet per minute on a monorail conveyor. It carries a series of steel boxes in which assembled molds are placed. Steel shot is automatically poured around the mold to support it against internal pressure developed during pouring.

Molten metal is brought from melting furnaces in pouring ladles suspended from a monorail. Each 200-pound capacity ladle pours from 12 to 16 molds on the average.

After pouring, the steel box moves to an automatic station where shot, casting and mold are dumped from the box. Shot is recycled for further use; casting and mold are transferred automatically to a cooling conveyor.



BIG

LOADING TOWER

Alliance

TRAVELING LOADING TOWER

This is one of four coal-loading towers on the 1196-foot-long pier of the C. and O. Railroad at Newport News, Va. Each tower can load 1,500 tons per hour.

There are two towers on each side of the pier. Each tower travels the length of the pier and either, or both towers, can completely service a boat. High-speed rubber belts permit complete loading and trimming without manual assistance and with only one mooring. Telescopic chutes and hinged, retractable booms provide easy docking and loading of all ships regardless of type or beam.

These traveling towers are examples of how **Alliance** designs, builds and installs the versatile, efficient machines that make the big jobs possible and practicable.

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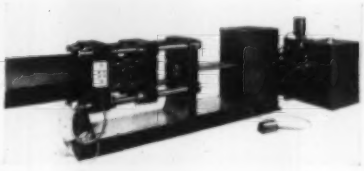
NEW PRODUCTS and equipment

Reply card on page 127 will bring you more information on any new products and equipment in this issue

Die Casting Machine

. . . adapted to aluminum

A heavy-duty cold-chamber-type die casting machine is announced by Harvill Mfg. The Model HD-303 is particularly adapted to casting



aluminum alloys at high speed from either single or multiple cavity dies. Magnesium and brass are also readily cast with the machine and zinc, lead and tin may also be cast after conversion to the hot chamber operation.

A special design feature permits fast and easy die changes. The machine also permits the pulling of cores in all directions. Cores may be operated manually, hydraulically or mechanically. Harvill Mfg. Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

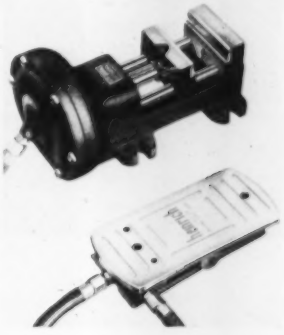
Precision Machine Tools

. . . with foot control

The addition of a model 33 air vise to Heinrich Tools' line has been announced.

The air vise is controlled by a foot pedal which leaves operator's hands free for rapid insertion or removal of work pieces in drilling, reaming, tapping, sawing, filing, light milling, grinding . . . resulting in greater accuracy, increased production in less time. The vise is fast and easy to set with simple, ratchet-operated, triple-thread adjusting screw locked by set screw on top of movable jaw. The air-cylinder is constructed of die-cast aluminum with diaphragm completely encased. Body castings are semi-steel. Operating parts are protected from oils, coolants, chips, etc.

With wide clearance between jaws, the sliding jaw is mounted on two hardened and ground parallel bars to maintain perfect jaw alignment. The vise is equipped



with one set of removable soft steel recessed parallel false jaws. Heinrich Tools Inc.

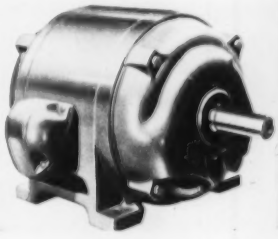
FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

New Motor

. . . drip and splash-proof

A new motor designated as Uniclosed, Type H, is more compact than previous models, according to U. S. Electrical Motors. One outstanding feature is its complete drip-proof design which also offers splashproof protection without increased cost. The frame is solid, one-piece cast iron and the stator is pre-wound. Frame sizes 182-184 are now available.

Conforming in every particular with NEMA specifications, the motor meets the same standards as its former type in temperature rise, torque, etc. Overload capacity has not been reduced. The slot design of the laminations has been improved and the asbestos-protected windings, an exclusive feature, have been reinforced and strengthened by the addition of Mylar lam-



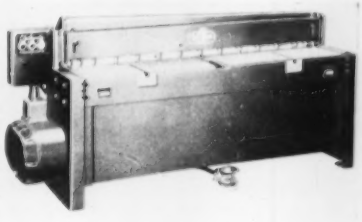
inations. A split dome, cast iron terminal box makes the leads more accessible. U. S. Electric Motors Inc.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Squaring Shear Line

. . . 20 to 14-gage mild steel

An entirely new, redesigned squaring shear line expanded to 18 models, available in 8 power-driven, 6-foot and 4-air types has been announced by Famco. Capacities range from 20 to 14-gage



mild steel in 22-inch to 72-inch sheet widths.

The line features the fast acting electromatic clutch, the instant action, electrically controlled 9-point jaw clutch. Standard equipment for power-driven shears

includes front, back and side gages, holddown, movable electric foot switch, Textolite gibs, 4-edged knives, motor and magnetic starter. Accessories available. Famco Machine Co.

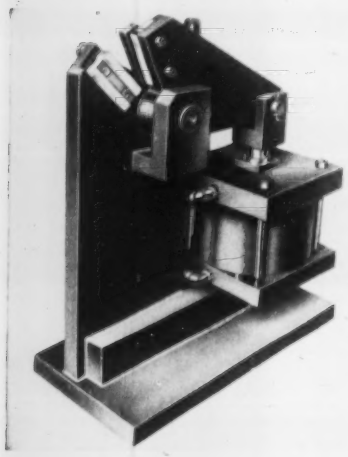
FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Air Shear

. . . completely air-operated

The Type B air shear developed by Curry is rated with a capacity to crop up to 1¼-inch diameter hot rounds at any air pressure between 60 and 100 psi.

Completely air-operated, this shear requires a floor space of only



16 inches x 33 inches and weighs less than 1,500 pounds. According to the manufacturer, the unit requires practically no maintenance as far as lubrication or replacement of parts is concerned. Design is such that only a single Alemite fitting for lubrication and a single set of bearings are included.

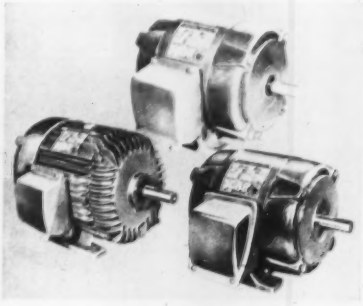
The Air Shear features four-edged knives as standard equipment, with set screws provided for adjustment after grinding. Since it operates automatically only at the time of actual cutting, continual running between cuts is eliminated. Curry Air Shear Corp.

FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Induction Motor

. . . comes in three enclosures

Westinghouse introduces a new induction motor, the Life Line-A, designed to offer users longer motor life, greater flexibility, as well as decreased size. It has improved ventilation, better insulation, a more efficient and better protected



bearing and is quieter and smaller per horsepower conforming to the new NEMA specifications. It is available in three enclosures: Totally-enclosed fan cooled, totally-enclosed non-ventilated and drip-proof.

Wire, coil, dip and cable insulations are all new on the motor. It has what is called a four way bearing seal. An inner seal is stationary and is attached to the outer bearing race. The outer seal rotates and is attached to the inner bearing race acting both as a seal and flinger to throw-off foreign particles. The frames of the motors are cast iron. Westinghouse Electric Corp.

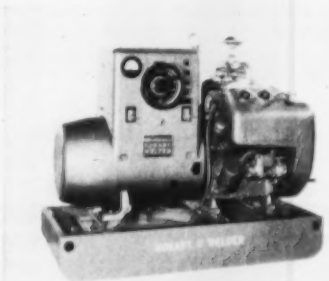
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Power Plant, Arc Welder

. . . dual-functioned

A combination power plant and arc welder is announced by Hobart Bros.

A selector panel in conjunction with a standard control panel



makes this machine a most versatile power unit. By removing only two wing cuts the selector panel can be moved to any one of three locations to provide 60 to 80 volts for welding, 1100 volt power or 220 volt power.

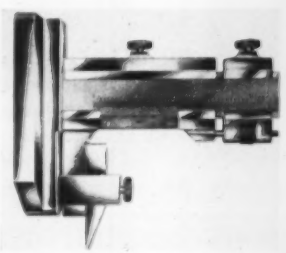
The generator is powered by a Wisconsin 4-cylinder air cooled engine with magneto ignition or hand crank starting. Not only full capacity 200 ampere ac arc welder is obtainable, but an ac power unit that will also supply sufficient power to operate 50 one hundred-watt lamps regularly or as an emergency standby power source. The unit can be used to operate electric drills, grinders, saws, hammers, compressors, paint sprayers and other electric motor driven equipment. Hobart Brothers Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Height Gages

. . . chrome-plated graduations

Foster Supplies is now marketing stainless steel height gages with chrome-plated graduations. Graduations and figures stand out



clearly against the dull chrome background, making them easy to read, eliminating glare and eyestrain.

The gages are impervious to rust or acidity. A longer slide, larger base and heavier beam insure greater accuracy and more dependable stability. They are obtainable in 12-inch, 14, 18, 24, 36 and 48-inch sizes. Foster Supplies Co.

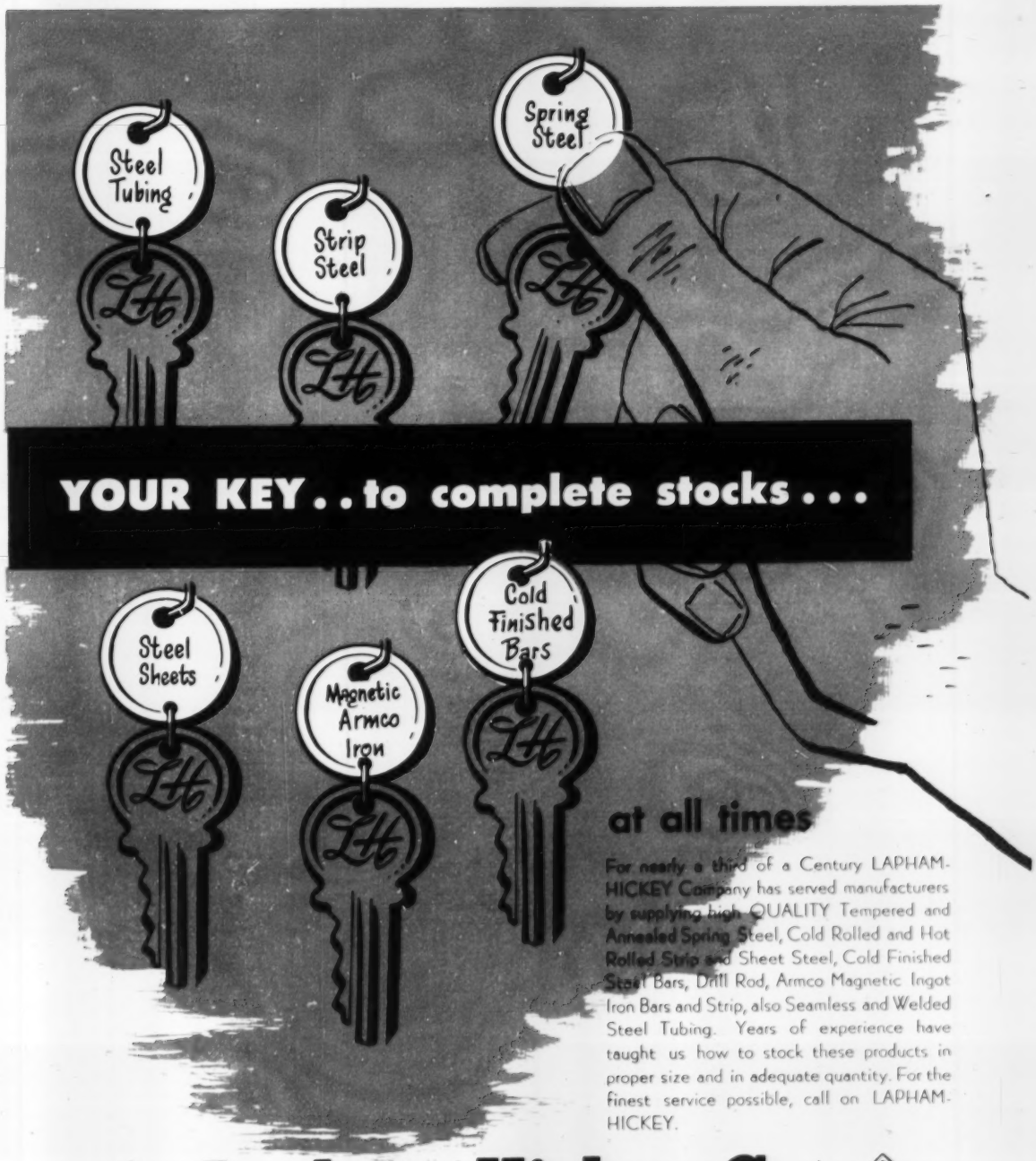
FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Shaving Machine

. . . finishes internal gears

National Broach offers a red ring gear shaving machine for precision shaving operations on internal spur and helical gears with from 3 to 12-inch pitch diameter.

This machine tool, Model GCR, is designed specifically to finish only internal gears. Gears having up to 4 diametral pitch teeth and



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AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: INDEX OF ACP CHEMICALS FOR METAL PRESERVATION AND PAINT PROTECTION

METAL	OPERATION	ACP CHEMICAL
ALUMINUM	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Preparation for Painting	"ALODINE" "DURIDINE" "DEOXIDINE"
	Protection from Corrosion	"ALODINE"
BRASS	Brightening	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK"
	Corrosion Prevention	"CUPROTEK"
	Soldering Flux	"FLOSOL"
COPPER, BERYLLIUM, AND COPPER ALLOYS	Brightening	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK"
	Coating Steel with Copper	"CUPRODINE"
	Corrosion Prevention	"CUPROTEK"
	Scale Modification	"RIDOXINE"
	Soldering Flux	"FLOSOL"
	Stripping Copper Coatings	"ACP COPPER STRIPPING SOLUTION"
GALVANIZED IRON, ZINC, AND CADMIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Corrosion Proofing	"ZINODINE"
	Paint Bonding	"ZINODINE"
	Phosphate Coating, in Preparation for Painting	"LITHOFORM"
	Soldering Flux	"FLOSOL"
IRON AND STEEL	Chromate Coating, in Preparation for Painting	"CROMODINE"
	Cleaning	"ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "DURIDINE"
	Coating with Copper	"CUPRODINE"
	Drawing and Extrusion	"GRANODRAW"
	Paint Bonding	"CROMODINE" "DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Paint Stripping	"CAUSTIC SODA AND SOLVENT NO. 3"
	Phosphate Coating, in Preparation for Painting	"DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Phosphate Coating, to Protect Friction Surfaces	"THERMOIL-GRANODINE"
	Pickling with Inhibited Acids	"RODINE"
	Rust Prevention for Unpainted Iron	"PEROLINE"
	Rust Proofing	"PERMADINE" "THERMOIL-GRANODINE"
	Rust Removal—Brush, Dip, or Spray	"DEOXIDINE"
	Soldering Flux	"FLOSOL"
MAGNESIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Pickling	"RODINE (M-200)"
STAINLESS STEEL	Cleaning	"DEOXIDINE"
	Coating with Copper	"CUPRODINE"
	Pickle Polishing	"RODINE"
	Soldering Flux	"FLOSOL"

CHEMICALS ACP PROCESSES

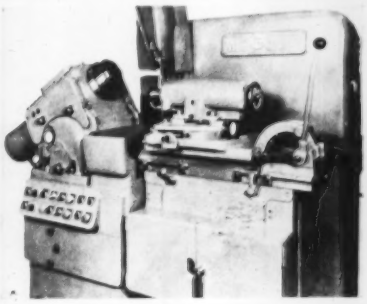
WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

NEW PRODUCTS and equipment

face widths up to 2½ inches can be shaved on this model.

One of the features of the model is a workhead permitting taper



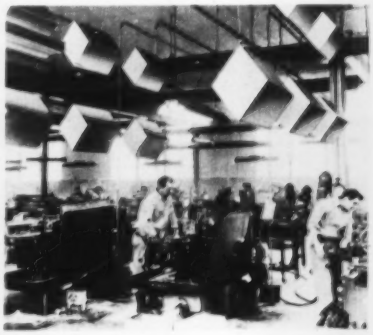
shaving operations with an optional pivoting feature that facilitates loading and unloading of internal gears such as those having wide faces or integral long shafts. National Broach & Machine Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Sound Absorbing Units

. . . break up sound waves

Small portable sound absorbing units manufactured by Sonosorber Corp. are reputed to have high value of noise absorption in both high and low frequencies. They are



especially suited for noisy industrial and commercial locations where ordinary acoustical treatment is not applicable or adequate.

(Continued on p. 130)

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

Casting Design

Meehanite Metal Corp.—Meehanite has prepared a 48-page report, "Meehanite Castings for Pressure Tightness." Illustrations of specific industrial application of their castings where specifications demanded absolute density, uniformity and resistance to various pressure ranges are contained in the bulletin. Some engineering property charts and pressure casting design suggestions are also given.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Electric Accessories

General Electric Co.—The full line of G-E oil-tight pushbuttons, indicating lights, selector switches and accessories is described in a four-color, 16-page publication. The booklet explains how this equipment operates and where it can be used. Included are cross-section drawings, full color application photos, dimension and outline diagrams.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Strap Cutter

A. J. Gerrard & Co.—A complete product information sheet covering a new strap cutter is announced by Gerrard. Description is given, with application data and grinding instructions. Diagrams, illustrated.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Replacement Chains

Kensington Steel Co.—A catalog covering their line of Kenkrome replacement chains is announced by Kensington. The 12-page report lists replacement chains, also covers renewable tooth sprockets, crusher parts, dipper tooth points and bases and crawler treads and idlers.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Transformers

Westinghouse Electric Corp.—Booklet covers large distribution transformers (250-500 kva) which are designed to cope with increased load densities on distribution systems. Construction and standardization characteristics are described and related to economic handling and operation procedures. Choice of windings, method of tap changing outside tank, and accessories are also covered.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

Vibration Isolators

Barry Corp.—Detailed technical and application information on the series 262 and series 633 Barrymounts is given in bulletin 537. Data on dimensions and load ratings, installation procedure, variation of natural frequency with load and per cent efficiency of isolation are also covered. Charts, diagrams, 4 pages.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Production Welding

Sciaky Bros. Inc.—SX 36 G, the new Sciaky standard multiple electrode machine for high-production resistance welding applications, its construction, welding control panels and operation are covered in a 6-page bulletin. Illustrated, diagrams.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Carbon Alloy Selector

Empire Steel Castings Inc.—A designation chart for carbon and low alloy steels has been issued by Empire. It identifies the company's isocast carbon and low alloy castings with ASTM, AISI, SAE, Federal and Navy specs. In addition, the chart gives chemical

STEEL 2-22-54

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analysis, mechanical properties, heat treatment and uses of the 18 steels listed.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Contract Casting

Franklin Balmar Corp.—A 32-page illustrated catalog describes foundry and machine shop facilities on a contract basis at Franklin Balmar. The catalog illustrates many of the different types of castings and machine shop products the company makes.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Electric Furnaces

Holcroft & Co.—A 4-page bulletin covering electric heat treat furnaces describes four types of electric heating elements and their methods of mounting. It also classifies heat treat furnaces according to their methods of handling stock. Illustrated.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Tool Steels

Firth Sterling Inc.—Two bulletins, covering Firth Sterling Extra (a water-hardening carbon tool steel) and Firth Sterling V (a water-hardening carbon-vanadium tool steel), have been added to the company's line. Information as to typical analysis, characteristics, applications, forging, heat treatment, annealing and tempering is given.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Tubular Equipment

Colonial Iron Works—A new folder details Colonial's standard line of exchangers, evaporators, crystallizers and other tubular equipment for process applications. Photographs show the product line and drawings, charts and tables support the detailed text. 4 pages.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Hydraulic Cranes

Ruger Equipment Inc.—Catalog presents the 1954 line of Ruger hand-powered hydraulic cranes, both floor and truck-mounted. The floor cranes, in models from 1000 to 6000 pounds capacity, include all the company's latest developments.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Strip Metal Feeder

Jaco Devices Inc.—Hydrafeed, a hydraulically operated strip metal press feeder, is described in a 4-page brochure. Its versatility, accuracy and operation principle are covered. Illustrated.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Motor Selection

Brook Motor Corp.—An 8-page brochure covers outstanding features of the Brook motor, recently introduced. A quickly visualized chart of electrical and mechanical features of standard and special motors is included to facilitate selection of the right motor for the job. Illustrated.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Mercury Switches

Micro Switch Division, Minneapolis Honeywell Regulator Co.—Micro Switch offers a 12 page, two color catalog on Honeywell Mercury Switches. The catalog covers standard designs of the switches for use in a-c or d-c switching applications that provide low force and tilt motion. Five families of switches are covered, 29 catalog listings are included.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Product Line

Cuyahoga Rivet Co. — Prices, weights, and dimensional and engineering data are given in a catalog on Cuyahoga Rivet's complete product line. 36 pages, with charts, tables and diagrams.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Scientific Sleuthing

Illinois Institute of Technology—Armour Research Foundation announces publication of "Scientific Sleuthing." The foundation conducts technical, patent and economic surveys of all magnitudes; surveillance of current technical information and bibliographies, abstracts and translations. This descriptive brochure covers the history of the foundation and its facilities.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Packaging

Hinde & Dauch Paper Co.—Shipping box savings and solutions for unusual packaging problems are featured in the January issue of "Package Laboratory News,"

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quarterly published by Hinde & Dauch. Articles show specific savings in time, labor, material and freight costs. A free packaging reference book is offered in the News.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Recording Systems

Sanborn Co. — Sanborn oscillographic recording systems and accessories for industrial use are covered in a 38-page catalog. Illustrations, technical data and specifications are included for four, two and one-channel recorders, as well as for the versatile 150 series system.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Chemical Index

Fisher Scientific Co.—New Edition of the Fisher Chemical Index is now available. 304 pages include a comprehensive line of individually lot-analyzed reagents. Structural formulas, molecular weights, melting points and boiling points, and color index number are listed.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Cam Follower

Smith Bearing Co.—A two-color, 6-page folder gives detailed description of Smith's new HCS cam follower. Load and life ratings and specifications for both the HCS cam follower and the regular type are given.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Boiler-Burner Units

A full description and complete data on the entire line of new Kewanee-Ray boiler-burner units are presented in a 16-page catalog. The catalog assists in selection of the proper unit for any application to high or low pressure heating, power or process steam.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

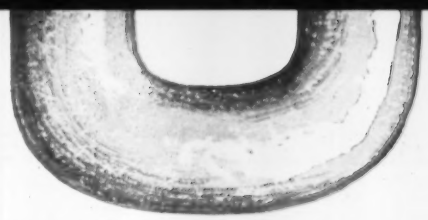
Squaring Shear

Manchester Machine Corp. — Outstanding features of the newly - developed Manchester high speed squaring shear are covered in a 4-page brochure, illustrated, with machine's specifications.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Demineralizers

Barnstead Still & Sterilizer Co. —Entire line of mixed-bed, two-bed and four-bed demineralizers is described in a 20-page catalog. It gives dimensional and performance data on all models, with con-



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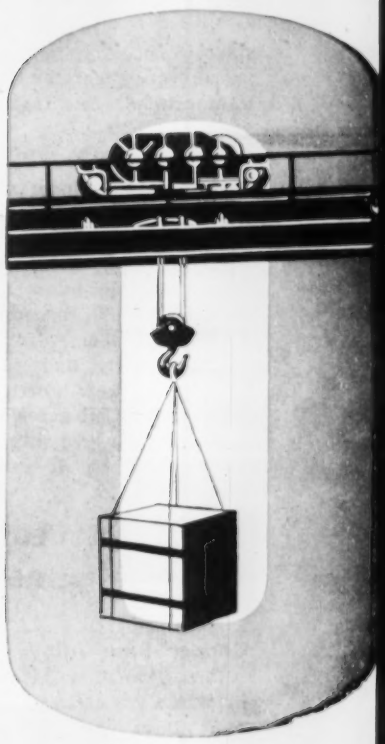
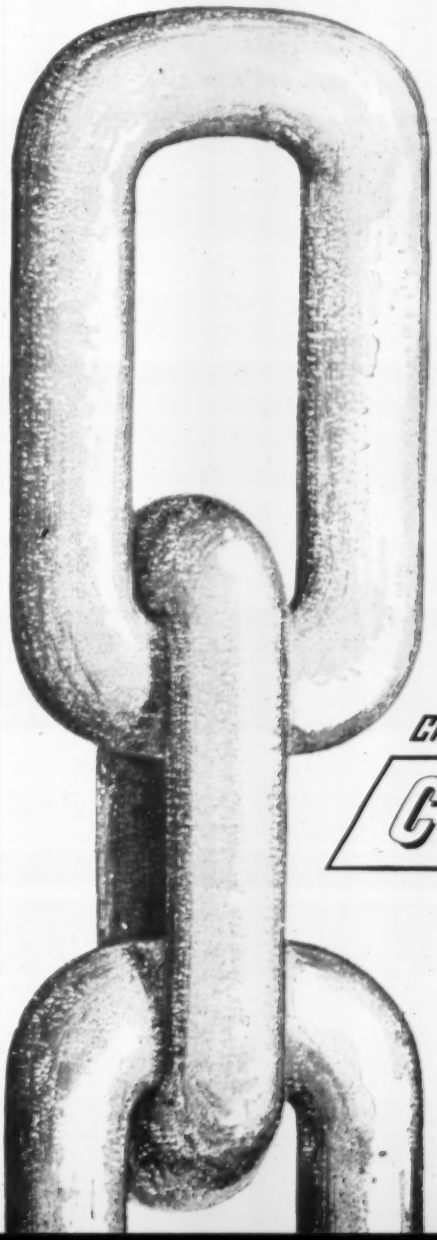




Strong link in your production chain can be a Conco Crane—custom-designed for a specific need. Conco Cranes are available in the capacity you need, the right lift, the right speed, the right clearances to serve a given station faster, at less cost, with less man power. Conco Cranes are backed by 36 years experience in the design of cranes, hoists, trolleys. Write for Bulletin 3000A illustrating and describing the Conco line.

CRANES HOISTS
CONCO

CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company
70—14th Avenue, Mendota, Illinois
AFFILIATES:
Conco Engineering Works-Domestic Heating Equipment
Conco Building Products, Inc., Brick, Tile, Stone

siderations affecting selection of proper equipment for a given job. Photographs, drawings and diagrams.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Thread Repair Inserts

Heli-Coil Corp. — Maintenance engineers and mechanics will find the new 4-page thread repair bulletin of use and interest. The bulletin shows how threads that have been stripped or worn can be repaired quickly and permanently. Five tables show how to select the proper Heli-Coil screw thread insert to repair five thread types.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

EDITORIAL REPRINTS:

Copper Base Alloys

Part Two of a series appearing in STEEL on classification of copper alloys is available. These offer the manufacturer a wide range of working properties. In machining, for example, shortness of chip and free-cutting are obtained by adding lead.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Industrial Fires

Harry E. Chandler, Associate Editor, STEEL, does a roundup of causes and cures for potential plant fires. Within the first two minutes, the most critical, a small industrial fire can be prevented from growing into a big one, if properly attacked.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Radio Moves Materials

Benefits of two-way radio systems are covered by W. R. Wolfe, STEEL Assistant Editor, in a recent article. This unseen expediter gives production management a voice in every handling operation. Manufacturers are profitting handsomely from its co-ordinating effects.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Lubrication

A lubrication is applied in vain, if not applied properly, says a recent article in STEEL. Application of efficient methods to lubricant purchasing, storing and use isn't a natural. It takes deliberate planning and some positive control.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

NEW PRODUCTS and equipment

(Continued from p. 126)

They are described as volume absorbers, with absorption areas larger than their physical dimensions in certain frequencies. Placed in the intense sound area, their physical structure tends to break up sound waves, attract and absorb or drain the sound due to diffraction.

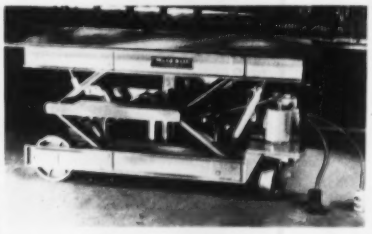
They are about 24 inches long and are hung on 2, 4, 6 or 8-foot centers or as desired. Their installation does not necessitate alteration or moving of sprinklers, lighting fixtures, skylights, ventilating or other existing equipment. Nonflammable, they can be installed to fit conditions. Sonosorber Corp.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Lift Table

. . . holds loads up to 5 tons

A hydraulic lift table was designed by West Bend Equipment to accommodate loads up to 5 tons, raising them up to 42 inches. Ball



bearing wheels and casters give the table easy mobility for either manual or shop tractor transport.

The table surface of smooth $\frac{1}{4}$-inch steel plate permits easy sliding of heavy parts for manual loading and unloading. To handle heavy dies, machine parts or sheet steel, the lifting mechanism consists of four cylinders fed from a central hydraulic unit which is operated either electrically or by a foot pump. West Bend Equipment Co.

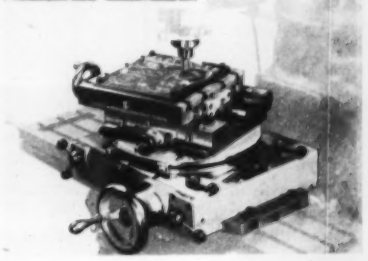
FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Tool and Die Table

. . . processes work quickly

Set-up time may be cut from 50 per cent on simple jobs to as much as 90 per cent on more complex jobs with Advance's new rotary-type tool and die table. According to the manufacturer, the unique design, found in this new unit, processes work on an entirely different principle.

This precision unit incorporates many construction features, some of which are: Hardened and ground feed screws and worm, hardened and ground gibs, normalized castings, precision tapered



Timken bearings, base completely sealed against foreign matter and all internal parts operating in an oil bath.

The unit is 9 inches high overall, $20\frac{1}{2}$ inches wide at the base, $18\frac{3}{4}$ inches deep (less hand wheel) and weighs approximately 325 pounds. Advance Products.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

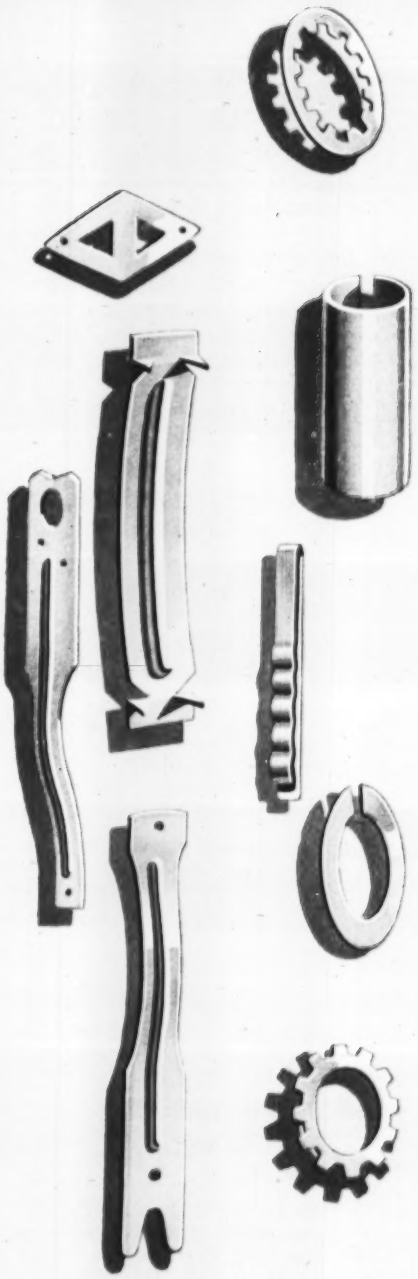
Telephone System

. . . offers new services

Among the features of a dial type intercommunicating telephone system are a memory circuit which repeats dialing of busy number

until clear and a device that allows key executives to cut in on a busy line with urgent message.

This telephone developed by Stromberg-Carlson's Sound Equipment Div. provides for direct con-



For easier blanking or forming...depend on the uniformity of

WEIRTON

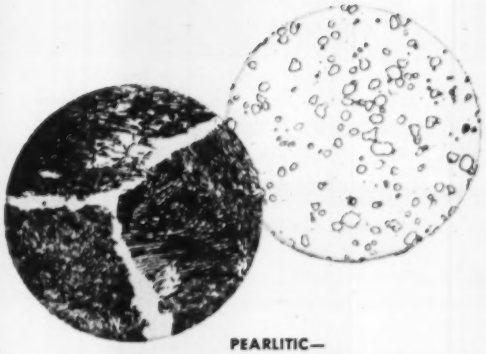
High-Carbon Strip Cold-Rolled Spring Steel

The requirements of high-speed cold forming or blanking are met consistently by Weirton cold-rolled spring steel. Formulated to exact specifications for each job, it makes the operation easy and economical for products in which high fatigue resistance is essential.

To an unusual degree, Weirton high-carbon strip cold-rolled spring steel possesses these highly important characteristics:

- Uniform chemical and physical properties
- Exact consistency of grain structure
- Accurate response to heat treatment
- Exceptional uniformity of gauge and width
- Controlled decarburization limits

It is supplied with the desired chemical composition and for specific heat treating and hardness ranges in strips up to seven inches wide.



SPHEROIDIZED—
Annealed, soft and ductile. Ideal for cold forming operations.

PEARLITIC—
Temper-rolled in controlled hardness and strength for blanking.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

nection with a paging or sound system, simple and easy calling of telephone conferences and unlimited simultaneous service of the entire system.

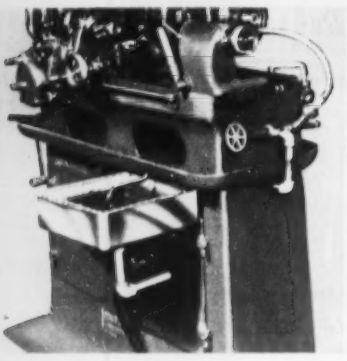
Dial-X systems are available in 20-line and 40-line capacities. It has its own power supply, ready to plug in to any 110-volt, 60-cycle line. The systems may be leased or purchased. Stromberg-Carlson Co., Sound Equipment Div.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

Filter

. . . with disposable tray

The Delpark Junior, a positive action filter for low coolant flow, offers greater saving in production time, more efficient machine operation, less downtime for tool



correction and dressing for grinders, shavers, cutters, hobbers, lappers, borers and hones.

Continuous positive filtration removes abrasive solids from the coolant as it comes from the work. The filter comes complete with combination mounting bracket and clean coolant return line, or if preferred, a connection is available for separate pipe or hose.

Servicing is accomplished in seconds. When a disposable tray becomes so filled with swarf that it will no longer take the flow of coolant, it is easily removed and replaced with a new one. Industrial Filtration Co.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Pocket Volt-Amp Testers

. . . with two voltage ranges

Three new high-voltage models have just been added to the Amprobe Junior line of pocket volt-amp testers by Pyramid Instrument. Each comes with two voltage ranges: 0-150 to 600 volts ac and is available in an ammeter range of 0-25, 0-50 or 0-100 amps

ac. These models are especially designed to fill the needs of the plant maintenance man, plant electrician and industrial contractor.

They do all the work of voltage testers, with instrument accuracy on a calibrated scale and also give an instant current reading without the need of shutting down equipment. Pyramid Instrument Corp.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Copying Machine

. . . for positives in seconds

An electric typewriter-size photocopy machine that reproduces black-on-white duplicates in under 45 seconds is being distributed nationally by Copease.

The photocopies made are high in contrast, dry, legally acceptable and may be duplicated on paper of any weight. All copies are permanent and fade-proof. No darkroom, special equipment or trained operator is required for the operation. Copease Co.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

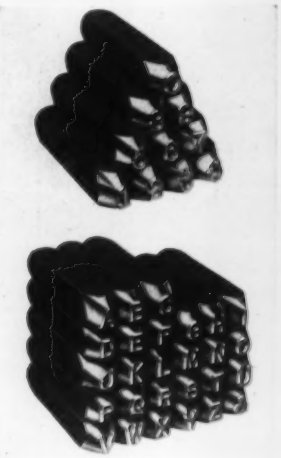
Stamps

. . . for marking forging dies

A series of flat-faced letter and figure stamps for marking forging dies is announced by Cunningham. Dies marked with Style FR stamps produce finished forgings with raised characters.

Sides of the characters of these stamps are a rounded 45 bevel. This provides a clearance in the stamped die so that when a part is forged, metal does not lock in the markings. The flat-faced features assure legibility in the marked forgings, while the round beveled sides reduce the number of rejects due to improper marking.

Made of Mecco Safety Steel, these stamps do not mushroom or



spall in service. They are available in a full size range from 1/16 inch to ½ inch. M. E. Cunningham Co.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

Self-Sticking Tape

. . . won't let go

A self-sticking tape of special interest to packaging people has been developed by Permacel Tape. The new tape, Permacel 16 Rayon Reinforced Acetate Film Tape, is made of rayon strands used to reinforce the clear cellulose acetate film, providing high tensile strength coupled with good shock resistance. This feature makes it possible for the tape to withstand whipping and shock which are serious problems in packing materials such as moldings and rod and bar stocks.

Permacel 16 is highly water resistant and is said to be transparent to the degree that carton lettering may be read after the tape is applied. Permacel Tape Corp.

FOR MORE DATA CIRCLE NO. 48 ON REPLY CARD

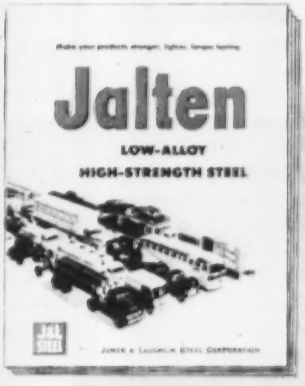
Take your pick...
THEY'RE ALL JALTEN!

J&L's New JALTEN series enables you to select low-alloy, high-strength steel in the following combinations of advantages:

JALTEN No. 1 — High strength, good formability and fabricating—good resistance to low temperature impact.

JALTEN No. 2 — High strength, moderate forming—improved resistance to atmospheric corrosion.

JALTEN No. 3 — High strength—improved resistance to abrasion.



The data you want is in this book:

- Chemical Properties of Jalten
- Mechanical Properties of Jalten
- Jalten Equivalents
- Jalten Application Data

Remember to specify JALTEN High Tensile Steel for

- HIGH STRENGTH • RESISTANCE TO CORROSION
- GOOD FORMABILITY • RESISTANCE TO ABRASION

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Jones & Laughlin Steel Corporation
Dept. 404, 3 Gateway Center, Pittsburgh 30, Pa.

Please forward a copy of your booklet, Jalten low-alloy, high-strength steel.

Name _____

Company _____

Address _____

Insul-Mastic

Pipe line systems that carry clean blast furnace gas to boiler house present constant maintenance problem. This line gets protection from mastic coating

MAINTENANCE:

Selling, Organization Come First

Management wants to know what it's buying with its maintenance dollar. The recent industry conference produced valuable know-how on organizing and selling the program

MAINTENANCE men attending the recent industry conference in Chicago got a thorough rundown on techniques for setting up an effective housekeeping program and making it work.

A series of five papers, beginning with a report on how to get management's OK on the maintenance program, provided basic mechanics for workable maintenance. Succeeding papers on the subject of organization dealt with cost control and budgeting, area vs. centralized maintenance, and the pro's and con's of preventive maintenance.

What Management Wants—In his discussion of getting approval for a maintenance program, K. W. Pratt, National Lead Co., says the problem must first be analyzed from the viewpoint of what management wants. This can be summarized in one word: Results. And results can be broken down five ways: 1. Efficient organization; 2. Economical long-range costs; 3. Performance in a safe, orderly and effective manner; 4. Optimum production; 5. To be informed.

Organization — Management's goal, says Mr. Pratt, is not that they run the organization, but that the organization run itself. The goal may be defined as selecting men, knowing exactly what you want men to do and seeing that they do it in the best possible way.

Some of the primary factors in establishing a well-founded organization:

1. Define the scope and limits of the departments—i.e., maintenance, construction and engineering.

2. Select the proper men for the jobs.

3. Train these men to fit the jobs—if necessary, after hours.

4. Keep personnel informed. Periodic staff meetings are desirable and should cover all levels of supervision.

5. Keep supervisory morale high. Use a positive rather than negative approach to problems.

6. Let subordinates assume full responsibility for their jobs. Let them stand on their own feet and actually manage separate sections.

Long-Range Costs — Management is interested in sustaining its business through the years. Thus, a sound maintenance program is one founded on economical long-range costs, emphasizes Mr. Pratt. He cites for emphasis the fact that probably the easiest way to cut maintenance costs is to stop performing maintenance. This, of course, is not economic, because if continued it would result in wholesale rebuilding of plant and installations.

Costs can be divided practically into two classes: Uncontrollable (labor rates and price of materials) and controllable (amount and kind of materials used, overtime and work efficiency). In brief, reports Mr. Pratt, the most effec-

Barrett-Cravens

Overhead maintenance—cleaning, light and ventilator repair work—is the subject of perpetual refinement. This mobile lift illustrates latest approach

tive ways to reduce these costs are: 1. Improved maintenance methods; 2. Improved materials; 3. Alterations to existing equipment to yield lower maintenance and production costs; and 4. Proper selection of new equipment for optimum results.

Information—Even after doing a good job, the average maintenance engineer becomes inarticulate when he tries to tell people about it. Actually, management wants to know about things before they happen, not after. Thus, to sell a program effectively, the maintenance man should provide answers to questions before they are asked.

So the problem of selling the program resolves into a question of how to advertise it. A good place to start is with periodic reports. The first, a forecast, should set forth the mechanical department's program for the coming year and should cover major shutdowns, anticipated annual expenditure, engineering program, equipment alterations, methods improvements and anticipated organizational plans. Follow-ups of forecast reports should be made to catch changes in original plans, show progress during major shutdowns, compare actual costs with budget figures. Other routine reports should go daily to production and management groups to summarize each day's proposed work, and monthly to the same people to provide an overtime and work order analysis. Of course, another complete report should be made at least annually to cover results of the mechanical department's program.

Finally, says Mr. Pratt, the most effective way to sell maintenance is through daily discussion with departments being serviced. Answer their questions, describe your plans, etc. If production and other departments are convinced you are doing a good job, the battle is more than half won. They will sell maintenance for you.

Cost Control & Budgeting

J. A. Openshaw, plant engineer, Stanley Home Products Inc., Easthampton, Mass., analyzing maintenance cost control and budgeting in a medium-sized plant, reports budgets in his experience have been over-rated, uninspired and misused. Nature of maintenance work — repairs, prevention, safety, security—all tend to make a budget unrealistic, says Mr. Openshaw. In fact, Mr. Openshaw's position is that a good maintenance department keeps down repair bills and minimizes shutdowns, so its success is intangible and does not lead to a rigid budget.

If not budgets, then what? The answer, says Mr. Openshaw, differs for all, but for his firm the answer was found in the maintenance department's own cost control system. This is set up in manhours for the plant maintenance department and in dollars for plant engineering projects. Projects are presented to management as they occur, or as need arises.

Controls—The company has set up the number of manhours for power plant, security and custodial work, preventive maintenance, repairmen in shop areas, electricians, pipe fitters, carpenters and lubricators. With proper supervision, this gives adequate control over day-to-day maintenance expense.

We know, says Mr. Openshaw, how many manhours we need for janitors, guards and firemen in our factory and warehousing space. No manhours will be added to this control without evidence of new or extra work. The same is true with all trades and with area repairmen. The men, however, are not told of cost controls. And when not instructed to work within certain controls, company records show employees often exceed expectations and perform in superior fashion.

Area vs. Centralized

J. B. Gibbons, plant engineer at General Electric Co.'s Evendale, O., plant, cites his plant's assignment of maintenance responsibilities as one that gives to production people the things they must control and gives over to centralized maintenance the functions better done by a central group. The Evendale plant consists of 13 buildings, with 3,761,000 sq ft of floor space. The 13 buildings are occupied by three operating departments, each handling its own maintenance of production facilities. The company believes having this decentralized setup keeps specialists in the area in which problems occur, permits quick action and simplifies paperwork.

On the other hand, there are utilities and maintenance functions that are common to the plant and which would be difficult to divide into three pieces. These are the responsibility of the central group. This group has responsibility for utilities such as steam plant and air supply system, water softening plant, power substation and gas reducing station. It is also responsible for the

main utility services in the buildings and has charge of plant grounds and building structures.

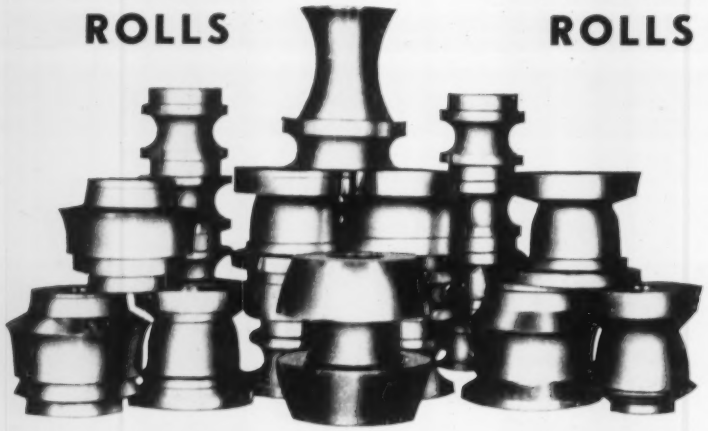
Defining Responsibility—Operating departments are charged with maintaining the utilities from main distribution lines to equipment and for equipment itself. They are responsible for internal building services—such as janitorial work, light replacement, etc. The operating departments, therefore, are staffed with maintenance people necessary to do day-to-day maintenance of productive equipment and related services, but not to take care of emergencies.

Central maintenance group has staffs for day-to-day work on grounds and buildings, and in addition, includes a work force of specialized trades that operating departments would not normally carry, such as carpenters, millwrights, iron workers and painters. These people serve as a pool of talent to meet emergencies that cannot be handled by the operating departments' regular personnel.

MEANS BETTER COLD-ROLL FORMING

▶ FORMING ROLLS

▶ TUBING ROLLS



▶ *To your specification or ARDCOR design —for all makes of roll forming machines*

Made of ARDCORLOY—a special alloy steel.

Maximum production speeds—better products. Any desired profile up to 36 inches in diameter.

Also, manufacturers of Straightening, Pinch and Leveller Rolls to customer's specifications.

American ROLLER DIE CORPORATION

29520 Clayton • Wickliffe, Ohio

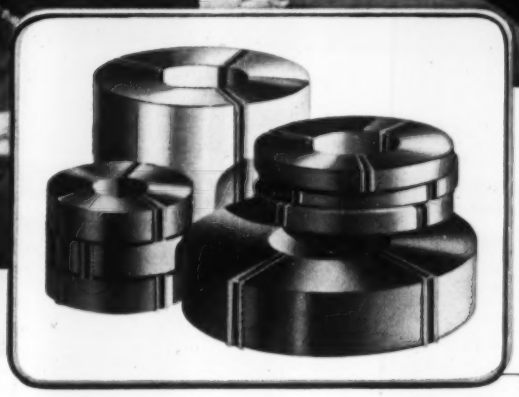
Preventive Maintenance

Experience, backed by records of past performance, can be the basis for individual decisions as to where to draw the line between preventive maintenance and making repairs as the occasion demands. This is the conclusion drawn by O. W. Graveley, Electro-Metallurgical Co. works engineer, in summarizing the case for the two maintenance techniques. Mr. Graveley says that where experience shows certain emergency repairs do not reduce production or increase over-all cost of maintaining equipment, it may be that such repairs can best be handled as the actual need arises.

However, Mr. Graveley emphasizes this can be done economically only where a substantial part of the total repair labor requirements are planned. Otherwise, since it is obvious that actual breakdowns cannot be predicted, a higher than necessary labor force must be maintained to meet extreme conditions. The alternative is excessive overtime premiums and lower labor efficiencies to meet inevitable resulting demand peaks.

Analyzing Data—Using his own plant as an example, Mr. Graveley cites one important instance wherein a preventive setup fosters efficiency. When set up properly, a preventive maintenance department can employ tabulating machines to analyze data. Electro-Metallurgical has used these machines for this purpose for about 8 months on analysis of the following:

1. Report of completed orders monthly, reported by charge and by department, including estimates of work by hours, actual performance by hours, variation between estimated and actual time by hours, and actual expenditures for labor in dollars.
2. Report on dollars and hours expended in each department, by craft and job, monthly.
3. Backlog of work by department and job, weekly.
4. Backlog of work by craft, weekly.
5. Report on jobs other than regular repairs, which contains all information the same as is prepared for regular repair jobs, monthly.



More Than a Product–
A Production Idea!

If you use strip steel in the manufacture of your products and coat the finished article *after* fabrication, here's a challenge to your imagination: Consider pre-coated Thomas Strip, shown in photo above, emerging from a slitting machine in Thomas' modern plant at Warren, Ohio. Thomas Strip steel is cold rolled to your exacting tolerances . . . then coated by the unique Thomas process with your choice of copper, zinc, brass, nickel, lacquer, tin, or lead alloy . . . then it can be planished or buffed to add extra eye-appealing luster.

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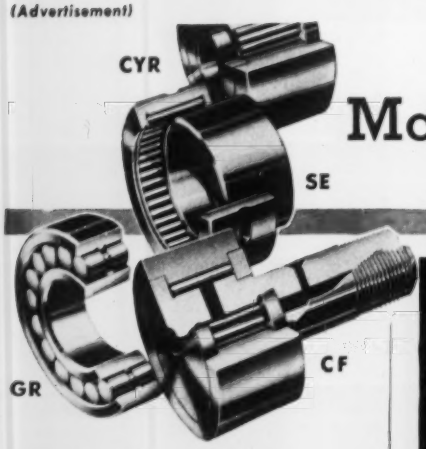
Thomas Strip®

COLD ROLLED STRIP STEEL

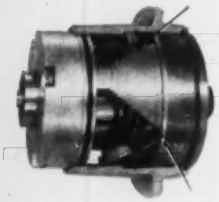
Thomas Strip Division
Pittsburgh Steel Company • Warren, Ohio

(Advertisement)



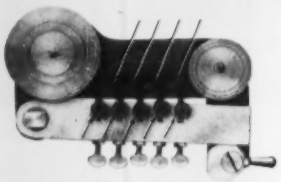
McGILL BEARING BRIEFS

MULTIROL CF BEARINGS PROVIDE POSITIVE CAM ACTION IN ANCHOR CUT-OUT

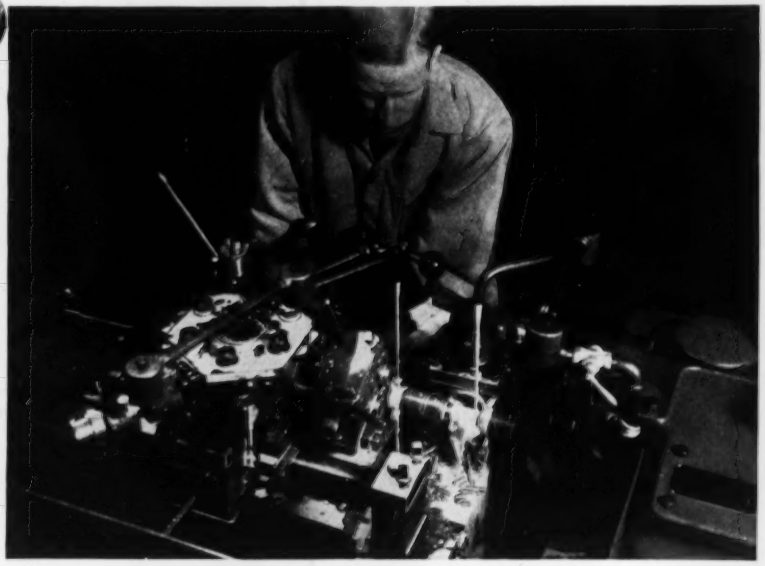


Anchor Steel and Conveyor Company relies on Multirol Cam Follower Bearings for positive and instant operation of Anchor cut-out couplings. When dangerous overload occurs this torque sensitive coupling cuts power when a spring loaded sliding sleeve is actuated by forcing CF series bearings up the inclined faces of a circular cam. Shock load capacity and dependability of CF series bearings combine to help the Anchor Company protect motors and machinery from damage due to overload.

SJOGREN KILLERS CAST WIRE ON MULTIROL CF BEARINGS



On Sjogren Killers for casting wire, Multirol CF bearings with outer races grooved to required wire size have replaced hardened steel rollers. Sjogren maintained required accuracy at much higher casting speeds with minimum of grease instead of objectionable oil lubrication.



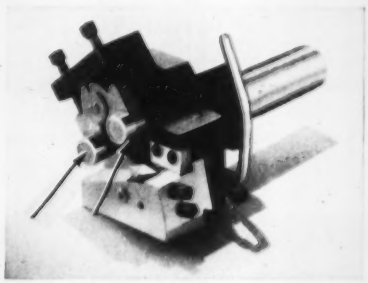
Warner & Swasey Uses MULTIROL® CF Bearings as STEADY REST ROLLERS ON TURRET LATHES

The precision turning done on Warner & Swasey Turret Lathes depends to a great extent on providing adequate, accurate and free turning support for the work in process. The pressure of the cutting tool must be backed up on the end opposite the chuck so that depth of cut and concentricity remains constant.

This support is provided with tool holders using two Multirol Cam Follower bearings as steady rest or bar turning rollers. The precision quality of these rolls is very important to efficient operation. Free turning rolls of adequate capacity will assure work with a smooth finish and a high degree of accuracy.

Warner & Swasey have been using Multirol CF Series bearings in this application for over 15 years. They adopted the McGill bearing after finding its precision quality, resulting from close radial tolerances, ideal to help insure superior lathe performance.

The outer ring of Multirol CF Bearings operates on a full complement of small diameter rollers so the load is



evenly distributed over a greater bearing surface. The inner race and flange are made in a single piece with the stud, preventing any possibility of disassembly. Close tolerance grinding of all bearing surfaces insures greater accuracy throughout longer bearing life and, compared with plain bearings, lubrication is simplified and less critical. Both starting and rolling friction are reduced to a minimum. As a result, internal wear is diminished and power requirements of Multirol bearing equipped machines are cut appreciably.

BEARING SELECTION GUIDE

A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

McGILL® — Precision Bearings

McGILL MANUFACTURING COMPANY, INC.

301 N. Lafayette Street, Valparaiso, Indiana

STEEL

February 22, 1954

Market Outlook

DEEP in Texas is a good example of why inventories of steel have been lasting longer than most people thought they would.

Late last fall when steel demand started to drop off, it was quite apparent that many buyers had built up sizable inventories of steel, even though steel supposedly was hard to get. It was commonly said then that demand for steel probably would be sluggish until the inventories had been reduced. The length of time needed to reduce them was dependent on their size and the need for steel.

HOW BIG?—How big were the inventories? In Texas, a distributor of steel was reported to be loaded with hot-rolled and cold-rolled steel sheets. He had no intention to live up to the Texan boast that everything is done in a big way in the Lone Star state, but by the time he was certain he should pull in the reins, it was too late to yell "whoa" on a flood of shipments on the way from mills to him.

Fortunately for him, other distributors in his area came to his rescue and are supplying their customers out of his warehouse. He is getting $10 a ton for handling.

Prolonging the reduction of inventories is a lowered rate of steel usage.

CONTRAST—While this inventory liquidation is going on, steel users are insisting that mills not make deliveries ahead of time. What a contrast from a year ago! Then, everyone was clamoring for steel from any place and at almost any price.

STEADY PACE—Nevertheless, steel demand is still good enough that mills operated at 74.5 per cent of capacity in the week ended Feb. 21. This is an increase of half a point over the preceding week.

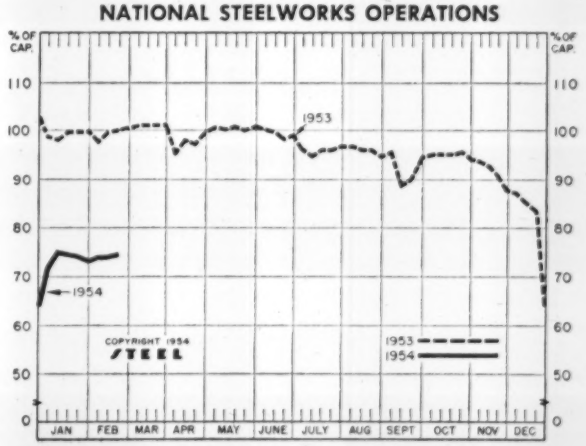
PRICES CUT—To compete with one another for business, steel companies are absorbing freight charges and making scattered price revisions. Last week a producer of seamless boiler tubes cut prices on hot-rolled and cold-drawn grades of that product approximately 10 per cent.

UNHAPPY—While more steel users are benefiting from freight absorption by mills than from straight reductions in prices, not all steel consumers are happy about freight absorption. A steel user in Chicago finds that freight absorption is lowering his advantage over his competitors farther away from mill sources of steel. When steel was in strong demand and customers had to pay all of the freight from the mills to their plants, the Chicago buyer didn't have as big a freight bill as his competitors farther from the mills. Consequently, his lower costs gave him a price and earnings advantage over his competitors.

The changes in prices of boiler tubes did not affect STEEL's price composite on finished steel. They are not a factor in the composite. The composite stands at $113.91 a net ton.

FOUR-YEAR LOW—On the other hand, STEEL's price composite on steelmaking grades of scrap declined 67 cents and reached $26.83 a gross ton, lowest level in four years. Not only are the steelmaking grades of scrap in light demand but so are the blast furnace grades, for blast furnace operations are at a reduced level.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Feb. 21	Change	Same Week 1953	Same Week 1952
Pittsburgh	86	— 0.5*	105.5	102
Chicago	83.5	+ 2*	103.5	102.5
Mid-Atlantic	74	— 1	95	98
Youngstown	70	+ 7	106	105
Wheeling	76	+ 1	100.5	100.5
Cleveland	78.5	— 2*	106	98.5
Buffalo	73	—10	106.5	104
Birmingham	80	+ 3.5	97	104
New England	65	+12	89	88
Cincinnati	74.5	+ 1	90	89
St. Louis	35.5	0	93.5	64.5
Detroit	72	— 8.5	101	101.5
Western	79	+ 8	110	106
National Rate	74.5	+ 0.5	100	100

INGOT PRODUCTION‡

	Week Ended Feb. 21	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	110.3†	110.4	109.9	139.1
NET TONS (In thousands)	1,772†	1,774	1,766	2,235

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

The Metalworking Outlook—p. 43 Technical Outlook—p. 101

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Feb. 16

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.863	Pipe, galv., buttweld (100 ft)	17.567	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.940	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.799
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.065
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.875	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Feb. 16 1954	Feb. 9 1954	Month Ago	Jan. Average
(1947-1949=100)	140.9	140.9	141.3	141.4

STEEL's FINISHED STEEL PRICE INDEX

	Feb. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	151.86
Index in cents per lb	5.140	5.140	5.140	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Feb. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$113.91	$113.91	$113.91	$110.98	$97.77
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.22
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	26.83	27.50	29.17	43.00	38.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.20	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.20	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.475-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Feb. 18 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	60.16	60.16	60.16	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$28.50	$29.50	$30.50	$44.00	$41.00
No. 1 Heavy Melt, E. Pa.	25.00	26.00	28.00	41.50	42.00
No. 1 Heavy Melt, Chicago	27.00	27.00	29.00	42.50	39.00
No. 1 Heavy Melt, Valley	25.50	27.50	29.50	44.00	37.75
No. 1 Heavy Melt, Cleve.	23.50	25.50	28.50	43.00	37.25
No. 1 Heavy Melt, Buffalo	25.00	25.00	25.00	43.00	44.00
Rails, Rerolling, Chicago	36.50	36.50	38.00	52.50	56.00
No. 1 Cast, Chicago	29.50	29.50	31.50	43.00	47.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 12.30, chemical 12.40, corroding 12.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, ½ in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $188-$191 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Feb. 18	Change	Previous Price	Jan. Avg.	Dec. Avg.	Feb. 1953 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.750	29.750	25.136
Lead	12.30	Feb. 18	12.80	13.060	13.300	13.300
Zinc	9.25	Feb. 15	9.50	9.760	10.000	11.431
Tin	85.25	Feb. 11	84.75	85.100	84.913	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, deld.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 85.25.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb f.o.b. shipping point; less than 1000 lb $5.10; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

Zinc: Prime Western 9.25, brass special 9.50, intermediate 9.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 10.60, special high grade 10.75, die casting alloy ingot 13.25, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 18.75-19.50; No. 12 foundry alloy (No. 2 grade) 18.25-19.00; 5% silicon alloy, 0.60 Cu max., 21.50-22.00; 13 alloy, 0.60 Cu max., 21.50-22.00; 195 alloy 20.50-21.00; 108 alloy 19.00-19.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 19.50-20.00; grade 2, 18.00-19.00; grade 3, 17.00-17.50; grade 4, 15.50-17.00.

Brass Ingot: Red brass, No. 115, 23.50; tin bronze No. 225, 34.25, No. 245, 28.50; high-leaded tin bronze, No. 305, 27.75; No. 1 yellow, No. 405, 19.75; manganese bronze No. 421, 24.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l, 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.00 per cwt; pipe, full coils $18.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R. ...	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In.; Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
4S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	—Round— 11S-T3	17S-T4	—Hexagonal— 11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ..	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5% ...	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 22.50; No. 2 copper 20.50-21.00; light copper 18.50-19.00; No. 1 composition red brass 16.00-16.50; No. 1 composition turnings 15.50-16.00; mixed brass turnings 10.00-10.50; new brass clippings 15.50-16.00; No. 1 brass rod turnings 11.00-11.50; light brass 9.50-10.00; heavy yellow brass 11.50; new brass rod ends 13.50-14.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets 13.50-14.00; brass pipe 15.00.

Lead: Heavy 9.50; battery plate 5.00-5.50; linotype and stereotype 12.00; electrotype 10.50; mixed babbitt 11.00-11.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.25; new die cast scrap, 3.00; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 13.50-14.00; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 12.00-12.50; mixed clippings 12.00-12.50; old sheet 10.50-11.00; old cast 10.50-11.00; clean old cable, free of steel 13.50-14.00; borings and turnings 10.50-11.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 20.00; auto radiators, 13.75, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50-23.00; light copper 21.00-21.50; No. 1 composition borings 17.50; No. 1 composition solids 18.00; heavy yellow brass solids 14.00; yellow brass turnings 13.00; radiators 14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00, 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-600 lb 53.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.181; 100-300 lb $1.031; 400-900 lb $1.007; 100-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 88.5; 20,000 lb and over 82.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Consumption of nonferrous metals exceeds purchases as buyers sit tight awaiting lower prices. However, there are signs that fabricators' reserves are drying up

PRICE confidence in most nonferrous metals is conspicuously absent.

Despite lowest prices in several years and free availability, buying lags behind consumption. Fabricators are still on an inventory diet. They appear determined to stay on it until satisfied the price is as low as it's going or until they run out of stock. A note of encouragement is seen in increasing reports that fabricators' reserves are drying up and that purchasing agents themselves foresee the end of the inventory recession soon.

Lead Trim Coming?—Lead users note they can get imports at one cent below domestic levels, duty paid, and feel a markdown in the U. S. quotation is inevitable. Stocks in producers' hands have increased each month since mid-1953, reaching nearly 200,000 tons today.

U. S. lead production was down 14 per cent last year to 335,000 tons, and stands to be even lower this year. As this is normally a slack season for lead, lack of current business is not viewed as alarming for sellers.

Bargains in Zinc—Zinc is in worse shape. Following a quarter-cent cut last week to 9.25 cents, zinc price is lowest since 1949 and less than half its post-Korea peak. Buyers still aren't satisfied it has hit bottom, many believing a 9-cent zinc isn't far away. Sales are up slightly from the January rate, but that month was horrible.

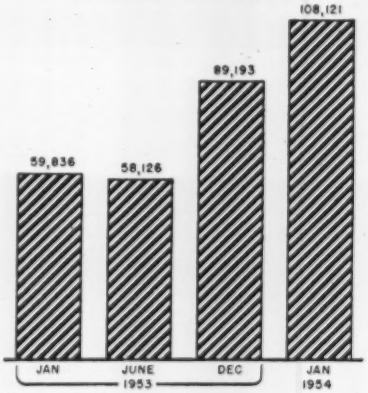
Another smelter cutback was reported last week: New Jersey Zinc Co. will curtail operations at two plants by 2000 tons monthly beginning in March. The company's over-all reduction since mid-1952 amounts to about 5000 tons monthly. Some eight companies have slashed smelter production by over 12,000 tons in recent months in a belated attempt to slow industry's rapid stock accumulations, now about 200,000 tons. It's debatable whether this is enough to reverse the unfavorable trend, and more cuts are likely. Zinc output last year was off 20 per cent to 535,000 tons.

Copper Conflict—Copper, too, is running well ahead of January, but it was the worst month since mid-1949. Deliveries to fabricators dropped over 35,000 tons from December to 77,091 tons and producers' stocks climbed over 20,000 tons (see accompanying chart). U. S. refined production was off 10 per cent from December to 111,553 tons.

Copper can head only downward in price. The move awaits the concluding installment in that drawn-out serial entitled "Chile Markets Her Copper." Brass mills, wire mills and foundries are buying cautiously. They have no intention of getting caught with high-priced copper on their hands when the market finally breaks. Their customers are on reduced rations for much the same reason.

TRENDS IN COPPER

(Refined stocks in U. S. at end of month, in net tons.)



Source: The Copper Institute.

Tin's Stability—Remarkable maintenance of a narrow price range in tin over the last three months hasn't stimulated customers to buy ahead though. They're generally sticking with spot or prompt tin, despite fairly attractive forward quotations. Unsettling factor is the proposed plan to set up a buffer pool to stabilize production and prices, which would greatly affect the course of the industry.

Hits at Tin Agreement

Sharp blast at U. S. ratification of the Geneva Tin Agreement was fired by a U. S. tin dealer last week. Nathan Trotter & Co. pointed out that if we ratify the agreement, we will go on record as a supporter of high prices (tin would likely rise to about 95 cents under the buffer stock purchase plan, the company says). Even more significant, we would be supporting foreign production of tin and would have no defense to demands to do the same for domestic products, particularly lead and zinc. The metals trading firm thinks it "hardly likely" that a stabilized price at high levels will encourage expansion in use of tin either.

What's Ahead for Nickel

The first quarter will be the toughest for civilian nickel users. That's what Defense Mobilizer Arthur Flemming told a Senate subcommittee investigating industry complaints of starvation rations. Though first-quarter deliveries will average up to a third less than those in the fourth-quarter of 1953, the difference will be made up in subsequent quarters so that over-all supply in 1954 will be approximately the same as '53, which was 40 per cent of pre-Korean use.

Testimony revealed that nickel production increase in the past two years had amounted to 40 per cent, all of which is going to stockpile. About 85 per cent of today's stockpiled nickel comes from government-induced expansion programs.

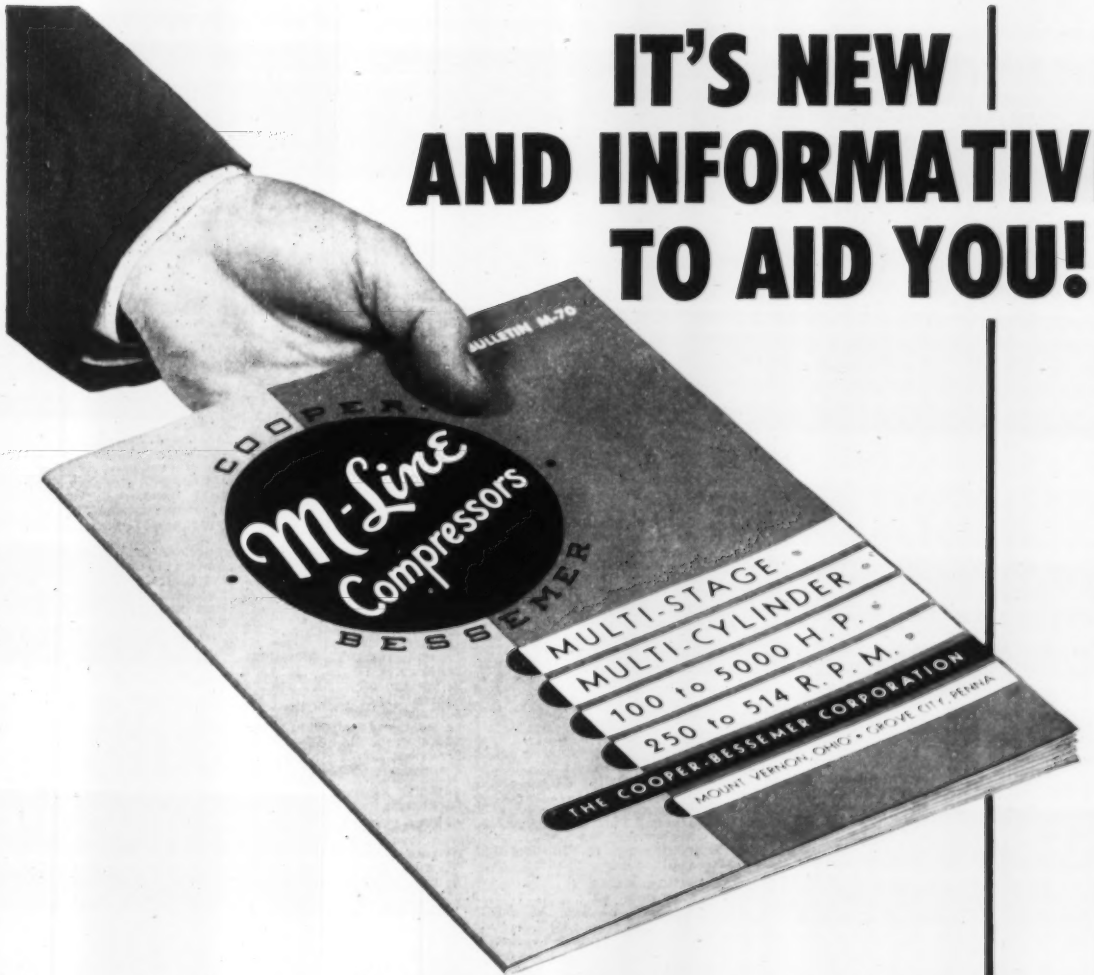
Gray market in nickel is flourishing, platers told the committee. They said prices are about double the market price—which would be a reduction from the asking price of a year ago.

An Easing for Copper, Brass

Military and AEC contractors, like civilian fabricators, are using less copper and brass products. Result is relaxation in mill setasides, effective Apr. 1.

In unalloyed brass mill products, setasides will drop from 15 to 10 per cent for plate, sheet, strip and rolls; from 11 to 8 per cent for seamless tube and pipe; from 16 to 11 per cent for rod, bar, shapes and wire. In alloyed brass mill products, plate, sheet, strip and rolls setasides will drop from 26 to 16 per cent. Rod, bar, shapes and wire will drop from 32 to 14 per cent and seamless tube and pipe from 55 to 38 per cent. In copper foundry and unalloyed powder mill products, the setasides will be reduced from 27 to 15 per cent. Copper wire mill setasides will be cut from 20 to 16 per cent.

IT'S NEW AND INFORMATIVE TO AID YOU!



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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 145. Key to footnotes, page 147.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana, Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna, N.Y. B2..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2, U5, W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 .....82.00
Conshohocken,Pa. A3 ...89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ....82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5, W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ... 113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ...4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 ....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.10
Conshohocken,Pa. A3 ...4.10
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
LoneStar,Tex. L6 .....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif. (30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 ....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago, Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ..4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran., Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ...5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 .....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 .....6.725
Ind.Harb., Ind. I-2 .....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ...6.225
So.SanFrancisco B3 ...6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ...5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 .5.20
Hartford,Conn. R2 .....5.75
Harvey, Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 .....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 .....6.325
BeaverFalls,Pa. M12 ...6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie, Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ...6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2, W14.6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Youngstown F3, Y1 ....6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling, Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¾-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ¼-1" B2 ..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 .....4.25
ChicagoHts.(3) C2, I-2 4.65
ChicagoHts.(4) C2, I-2 4.15
FortWorth,Tex.(26) T4 4.65
Franklin,Pa.(3) F5 .....4.65
Franklin,Pa.(4) F5 .....4.15
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 .....4.15
Williamsport,Pa.(3) S19 4.50
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5..15.50

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925

Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown, U5, Y1 ...3.925

SHEETS, H.R. (19 gage)

AlabamaCity, Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ...6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ...5.90
Ind.Harbor,Ind. Y1 ...6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ...5.90
SparrowsPoint(36) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless, Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ...5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ...4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ...7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O W10	6.075	....
Pitts.,Cal. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.825
Irvin,Pa. U5 ..... 5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.625

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Conn.(10) S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackawna,N.Y.(25) B2 3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ....5.025
NewBritain(10) S15 .....4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25) B3 4.675
SparrowsPoint,Md. B2 .3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ...5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor Ind. Y1 .....6.45
Lackawanna,N.Y. B2 ...6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3 6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G5 .....5.45
Bridgeprt,Conn.(10) S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ....5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ....5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 .....6.10
Middletown,O. A10 .....5.45
NewBedford,Mass. R10 .6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5...5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ....5.90
Pawtucket,R.I. NS, R3. 6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(24) R6 .....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.85
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) NS 12.15
Pawtucket,R.I.(12) NS 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ...8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 .....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. B2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 .....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth.Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R8 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 ReliancetDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn SteelCo.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beren,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	7.85	8.15	8.75	9.75	10.65
Vandergrift,Pa. U5	...	8.15	8.75	9.75	....
Warren,O. R2	7.85	8.15	8.75	9.75	....
Zanesville,O. A10	...	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville, O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	....	....	....	....	12.35‡

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 lb Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.70	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8"Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.55
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo, W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark, Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12), N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld.	Galv.
Ala.City R2	6.675	7.075**
Aliquippa J5	6.675	7.20*
Atlanta A11	6.775	7.30
Bartonville(48)K4	6.775	7.30
Buffalo W12	6.675	7.075†
Cleveland A7	6.675	....
Crawfordsville M8	6.775	7.30
Donora,Pa. A7	6.675	7.075†
Duluth,Minn. A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex. S5	7.075	7.475
Jacksonville,Fla. M8	7.20	7.73
JohnstownB2(48)	6.675	7.225*
Joliet,Ill. A7	6.675	7.075†
KansasCity,Mo.S5	7.275	7.675
Kokomo C16	6.775	7.175†
LosAngeles B3	7.625	....
Minnequa C10	6.925	7.325**
Monessen P7(48)	6.675	7.225
Palmer W12	6.975	7.375†
Pitts.,Calif. C11	7.625	8.025†
Portsmouth,O.P12	6.675	....
Rankin A7	6.675	7.075†
So.Chi'go R2	6.675	7.075**
S.S.Frn.(48)C10	7.625	8.025**
Spar'wsPt.B2(48)	6.775	7.325*
Steri'g(1)(48)N15	6.675	7.175
Struthers,O. Y1	6.675	7.175
Worcester A7	6.975	....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	142

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	151
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	158
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	155

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

	An'ld. Stone	Galv. Stone
WIRE, (16 gage)		
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.25
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	....	....	....	....	....	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	−0.25	19.50	+4.25	12.5	+8.5	....	....	....	....	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	21.5	36.75	21	36.75	21	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.02	18.44
1¼	13	....	22.53	18.12
1½	13	20.65	24.91	20.01
1¾	13	24.40	29.43	23.66
2	13	27.34	32.98	26.51
2¼	13	30.80	37.15	29.86
2½	12	33.43	40.32	32.41
2¾	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.52	51.28	51.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer, Pa. U5	4.325	4.225	4.275	5.20
Ensley, Ala. T2	4.325	4.225	.....	5.20
Fairfield, Ala. T2	....	....	....	5.20
Gary, Ind. U5	4.325	4.225	4.275	...
Huntington, W.Va. W7	....	....	....	5.20
Indiana Harbor, Ind. I-2	4.325	4.225	4.275	...
Johnstown, Pa. B2	....	....	...(16)	5.20
Lackawanna, N.Y. B2	4.325	4.225	....	5.20
Minnequa, Colo. C10	4.325	4.125	....	5.70
Steelton, Pa. B2	4.325	4.225	....	...
Williamsport, Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield, Ala. T2 .....5.125
Gary, Ind. U5 .....5.125
Ind. Harbor, Ind. I-2 ...5.125
Lackawanna, N.Y. B2 ..5.125
Minnequa, Colo. C10 ..5.125
Pittsburg, Calif. C11 ...5.275
Seattle B3 .....5.275
Steelton, Pa. B2 .....5.125
Torrance, Calif. C11 ..5.275

TRACK BOLTS (20) Treated

Cleveland R2 .....11.00
Kansas City, Mo. S5 ....11.00
Lebanon, Pa. B2 .....11.00
Minnequa, Colo. C10 ...11.00
Pittsburgh O3, P14 ....11.00

JOINT BARS

Bessemer, Pa. U5 ....5.275
Fairfield, Ala. T2 .....5.275
Ind. Harbor, Ind. I-2 ....5.275
Joliet, Ill. U5 .....5.275
Lackawanna, N.Y. B2 ..5.275
Minnequa, Colo. C10 ..5.275
Steelton, Pa. B2 .....5.275

AXLES

Ind. Harbor, Ind. S13 ....6.50
Johnstown, Pa. B2 .....6.50

STANDARD TRACK SPIKES

Ind. Harbor, Ind. I-2, Y1 .7.05
Kansas City, Mo. S5 ....7.30
Lebanon, Pa. B2 .....7.05
Minnequa, Colo. C10 ....7.05
Pittsburgh J5 .....7.05
Seattle B3 .....7.55
So. Chicago, Ill. R2 ....7.05
Struthers, O. Y1 .....7.05
Youngstown R2 .....7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
7/8-in. under .....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ¾-in. 5
⅞-in. and larger ... 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long. 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
¾" and smaller 58
⅞" to 1⅛", inclusive. 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex.:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34
¼-in. diam. & larger .. 14
N.F. thread, all diams... 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 & 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
⅞-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller ... 20
⅞-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron: Cents
98+% Fe, annealed. 18.00
Unannealed 14.50
Swedish, c.l.f. N.Y., c.l., in bags 11.25

Electrolytic iron:
Annealed, 99.5% Fe. 42.50
Unannealed (99+% Fe) 36.50
Unannealed (99+% Fe) (minus 325 mesh) 53.50

Powder Flakes (minus 16, plus 100 mesh).. 31.00

Carbonyl Iron:
97.9-99.8% size 5 to 10 microns..83.00-148.00

Aluminum:
Atomized, 500 lb drums, freight allowed:
Carlots 31.00
Ton lots 34.00

Antimony, 500 lb lots 32.00*
Brass, 20-ton lots.29.25-36.50
Bronze, 10-ton lots 51.00-60.00

Copper:
Electrolytic 13.50*
Reduced 13.50*

Lead 7.50*
Magnesium 75.00-85.00

Manganese:
Minus 35 mesh 61.00
Minus 100 mesh 67.00
Minus 200 mesh 72.00

Nickel unannealed 89.50
Nickel-Silver 5-ton lots 47.00
Silicon 43.50
Solder 8.50*
Stainless Steel, 302 ... 91.00
Tin 14.00*
Zinc, 10-ton lots..17.50-25.00
Tungsten Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over... 4.95
Less than 1000 lb .. 5.10
Chromium, electrolytic 99.9% Cr min. 3.60

*Plus cost of metal.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 30c
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound, subject to current lists of extras)

AISI type	Rerolling ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	53.00	39.50	49.75	59.75	71.00
501	....	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	....	.....	46.00	....

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20	4.25	1.6	12.25	....	3.875
18	4.25	1	4.75	....	2.160-2.320
18	4	2	9	....	2.515
18	4	2	....	....	1.640
18	4	1	....	....	1.480
13.5	4	3	....	....	1.735
6	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3 M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevilleisland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wimerding,Monaco, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	....	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	6.20	7.12	7.78	7.00	...	6.86	8.17[4]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[3]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.27	6.71	7.36	6.56	7.60	12.12	6.93	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50[4]	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Jersey City, N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[4]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.35	7.13	7.90	7.02	8.80	6.87	8.19[4]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.15	7.25	7.35	9.40
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [3]—500 to 9999 lb; [4]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Number of Warehouse Steel Orders Gains

Distributors press for small orders from large users of steel who normally purchase sizable quantities from mills. Total volume is increasing slowly but is expected to pick up

Pittsburgh Large users of steel, formerly ordering in sizable quantities, are holding back on purchases, and warehouses continue to press for this business. Fabricators ask and receive delivery on short notice, as distributors concentrate on rapid handling of orders.

Standard structural shapes, recently hard to obtain, are now "fairly ample in supply."

Chicago — Steel warehouses are looking to second quarter for an upturn in sales. Somewhat lower manufacturing schedules, plus a deeper dip into inventories, are combining to reduce purchases of new material from distributors. Low stocks of steel no longer are hazardous for the metal fabricator. Abundance of almost every steel product is reason for that.

Boston — If February sales with warehouses exceed January, the margin will be slight; number of orders is maintained, but tonnage per order is small. Inventories are balanced to meet substantially more volume than that now booked by distributors. Some are too heavily stocked on flat-rolled and bars; coupled with foreign steel offerings, prices are softening in spots. Warehouses are placing only replacement orders with mills.

Philadelphia — Warehouse business is creeping up. Most distributors say that February trading on a daily basis is running ahead of January and that March should be better, as it is traditionally one of the best months of the year. Orders currently are small, but more numerous. Also, they are quite diversified as to products. If any one item appears any more active than others, it is shapes, according to one leading distributor.

St. Louis — Warehouse steel demand has dropped so low several are canceling orders to mills in an effort to prevent their own inventories getting too badly out of balance. Busines generally is holding at December's and January's low levels.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ⅝ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Demand for flat products is especially soft as fabricators liquidate big inventories. Occasional spot trimming of prices has appeared. Most warehousemen are optimistic for at least a moderate upturn in March.

Los Angeles—Warehouse activity is off from last year's peaks, but distributors say the downward trend has leveled off and is reversing itself slowly. Demand is currently sluggish, but is expected to quicken after Mar. 2, which date marks the expiration of the inventory tax period.

San Francisco—Warehouse business is spotty, but when totaled up at the end of the month comes out to a pretty good volume, although down from the record months prior to November. January showed a big upturn in the early part of the month, then quieted a bit. February, so far, is described as "pretty good."

Seattle—Distributors reflect optimism as they note increased buyer interest and a consequent marked upturn in sales volume over January. Construction is resuming activity and this is reflected in the warehouse trade. Distributors have complete inventories and are in position to make prompt deliveries.

Prices in the Seattle-Tacoma area are firm and steady, but the price war in the Portland, Oreg., area continues unabated, applying particularly to carlots. Surplus foreign steel is also a factor in this disturbed condition.

Stainless Steel . . .

Stainless Steel Prices, Page 148

Pittsburgh — Sales are mounting after several slow months. Demand for stainless sheets is firming from airplane and automakers, although sales to railroads are low. Incoming orders haven't gained significantly as yet, but the market outlook is improving.

Semifinished Steel . . .

Semifinished Prices, Page 144

Chicago — Steel ingot production here appears headed for a slightly lower level than has prevailed so far this year. Little better is expected before second quarter. Current operation is at 83.5 per cent of capacity—equivalent to 90 per cent of 1953 capacity. In some cases, finishing mills are running at a higher level, being maintained by ingot inventory. The three-day unauthorized walkout at Wisconsin Steel Works of International Harvester Co. a week ago reduced the district steelmaking rate by almost 2 points.

Sheet Users Watch Inventories

Many buyers shrinking stocks to rock bottom. Depending on prompt shipments for needs. Sudden reversal in business trend would catch some consumers with short supplies

Sheet and Strip Prices, Page 144 & 145

Boston—Carryovers will contribute little or nothing to second quarter sheet and strip production—there will not be any delinquent unshipped tonnage overhanging mills Apr. 1. Orders are being placed through April-June period in small volume, but some March capacity is open. With the quarter two-thirds gone, buying for some weeks has doomed usual increase in production next month. Prices also are bending; mill base for sheets holds, but extras are eased, or officially revised, as on some deep drawing grades, bringing into open what has been going on for some time. Cold strip converters generally have lowered carbon grades, up to 0.40 carbon, $4 per ton on an average and are not building up hot-rolled inventories.

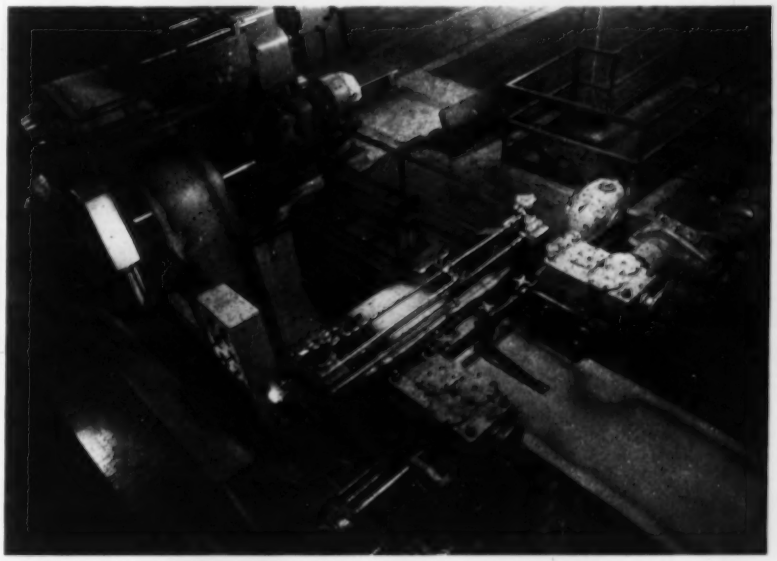
New York — Stainless steel sheet demand is showing the first appreciable improvement since last fall. Jobbers are beginning to replenish stocks and there is livelier inquiry from manufacturers of cutlery and cooking utensils; better yet from builders for architectural trim and the like.

Pittsburgh—Hot-rolled sheet and strip sales remain slow, with some empty pages in March order books. Galvanized sheet demand is stronger, running about 10 per cent higher than hot-rolled sheet in per cent of production capacity in operation.

Chicago — A sudden reversal of business trend probably would catch many sheet users flat footed. Order books of mills indicate that manufacturing plants are shrinking their inventories down to a rock bottom minimum since they believe fast replenishment is an easy trick.

St. Louis—Sheet shipments continue fair with the first half of February showing a 20 per cent increase over January. Primarily the boost results from shipping all accumulated past-due tonnages. Production showed no corresponding increase, since the major mill here had double its normal finished steel inventory on hand.

Closing Mar. 8, Airforce Depot, Topeka, Kan., is taking bids on 135



Operations Start at Pittsburgh Steel's New Mill

Pittsburgh Steel Co.'s cold-rolled sheet mill at Allenport, Pa., will begin shipments in March. First unit to start operations was the flying shear line. Although designed to shear cold-rolled sheets, it is at present going through break-in period processing hot-rolled sheets. A second shear line, equipped to handle heavier gage sheets, is ready for operation. A workman, above, feeds coils to the entry end of the shear line to an uncoiler, then to a side trimmer

tons, mostly cold rolled chromium-nickel sheets.

Los Angeles—Kaiser Steel Corp., Fontana Works' flat-rolled order books are filled through March.

Steel Bars . . .

Bar Prices, Page 144

Philadelphia—While some consumers of bars have shaken down their inventories to a point where they are specifying more freely, it is having small bearing on the over-all situation. Business still lags, with some question as to whether the daily movement in March will be any better than at present. A free supply exists in all sizes and shapes, in both the hot and cold categories, and in the carbon and alloy grades.

Trading in galvanized sheets continues to show more life, relatively, than in the other major grades. One large producer is rolling at capacity this month and contemplates an equally good schedule in March. Some others are not in as strong a position, but nevertheless, report a good demand.

In hot and cold sheets, and most specialties, business remains slow—perhaps a shade better than in January.

Ingot Output Rises in January

Slight gain reported over December production but total is down sharply from a year ago. Industry operated at 75.4 per cent based on annual capacity of 124.3 million net tons

New York—Production of ingots and steel for castings in January totaled 7,960,000 net tons, reports the American Iron & Steel Institute. This was a slight increase compared with output of 7,946,328 tons in December, 1953, and was down sharply from the 9,897,962 tons produced in January a year ago.

Production during the month was stabilized with the index standing at 111.9 (1947-49 base—100) after it had declined to 111.7 in December from 133 in October, the Institute states.

The revised total for all of 1953 is 111,609,719 net tons, the greatest amount of steel ever produced in one calendar year. It compares with 93,168,039 tons in 1952, and is more than 6.4 million tons greater than the record tonnage produced in 1951.

Steel production in January was at 75.4 per cent of the new industry capacity, now rated at 124.3 million tons. The December output was at 79.7 per cent of capacity which in 1953 was rated at 117.5 million tons. The 1953 total production was at 94.9 per cent of that year's capacity, compared with 85.8 per cent in 1952 and 100.9 per cent in 1951, based on production capacity in the respective years.

The production index for 1953 is 133.2, compared with 110.9 in 1952 and 125.6 in 1951. This is the new Institute index based on average steel production in the three years 1947 through 1949 as 100. Index is adjusted for length of month and year but not for seasonal variation.

Thompson Wire Co. will be rolling cold-rolled strip at its new mill, Sparrows Point, Md., by late this quarter. Mill base price, low carbon and up to 0.40 carbon, will be 5.60c.

Boston—Forward buying of carbon and alloy bars is confined to shops still braced with defense or other contracts requiring fixed tonnages monthly. Number so situated is small. For most part buying is for prompt delivery, two to three weeks for most tonnage grades; even better delivery is possible from stock in more instances. Bar users are carrying less steel and in many instances consuming less.

Pittsburgh—Barmakers were still taking March orders last week. They reported large size bars selling well, but smaller sizes moved slowly.

Chicago—Demand for steel bars, both hot-rolled and cold-finished, continues to reflect a slight stronger tone insofar as use for farm equipment is concerned but practically every other consuming classification is either "status quo" or off a little more.

Airforce Depot, Topeka, Kan., is taking bids, closing Mar. 5, on 370 tons of alloy bars and rod, including 235 tons of chromium-nickel-moly round rods.

Wire . . .

Wire Prices, Page 146

Boston—Wire producers, having failed to book near capacity on most items for February, are scheduling for March with incoming volume slightly heavier. Unless orders pick up materially, however, there will be openings through next month, notably in manufacturers' bright wire and cold-heading stock. Scattered

Period	OPEN HEARTH Net tons	Per cent of capacity	‡Index	BESSEMER Net tons	Per cent of capacity	‡Index	ELECTRIC Net tons	Per cent of capacity	‡Index	TOTAL Net tons	Per cent of capacity	‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
‡January	7,257,000	78.3	113.3	260,000	63.9	74.0	443,000	49.9	124.0	7,960,000	75.4	111.9	1,797,000	4.43
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,299	100.8	137.2	329,389	92.6	103.8	664,091	84.6	205.9	8,932,779	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st 6 mos.	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,068	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.42
August	8,463,155	97.0	132.1	310,074	78.7	88.2	632,351	72.7	177.0	9,405,580	94.2	132.2	2,123,156	4.43
September	8,076,277	95.8	130.3	287,638	75.6	84.6	519,513	61.9	150.3	8,883,428	92.1	129.0	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	168.6	27,564,681	93.1	130.6	2,099,366	13.13
9 mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,580	39.00
October	8,648,428	99.1	135.0	325,250	82.6	92.6	489,044	56.3	136.9	9,462,722	94.7	133.0	2,136,055	4.43
*November	8,002,349	94.7	129.1	283,321	74.3	83.3	404,382	48.0	117.0	8,690,052	89.9	126.2	2,025,653	4.29
*December	7,321,947	84.1	114.3	269,813	68.6	76.8	354,568	40.9	99.3	7,946,328	79.7	111.7	1,797,812	4.42
*4th Qtr.	23,972,724	92.6	126.1	878,384	75.2	84.2	1,247,994	48.4	117.7	26,099,102	88.1	123.6	1,986,233	13.14
*2nd 6 mos.	48,828,498	94.4	128.4	1,800,164	77.1	86.3	3,035,121	58.9	143.2	53,663,783	90.6	127.1	2,042,778	26.27
*Total	100,473,823	97.9	133.2	3,855,705	83.2	93.2	7,280,191	71.1	173.1	111,609,719	94.9	133.2	2,140,578	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

*Revised. ‡Preliminary figures, subject to revision. †Index of production based on average annual production of the three years 1947-1948-1949.

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orders are appearing from consumers who took little or nothing in February.

Rem-Cru Reduces Prices

Titanium sheet, bar, plate and billet price cuts range up to 14 per cent

REM-CRU TITANIUM INC., Midland, Pa., announces a new titanium price schedule based on costs. Higher production and improved processing make possible major price reductions, Rem-Cru says. Bars, billets, sheets and plates are covered in the new price schedule. New prices for other products, such as narrow strip and wire, will be released later.

Although Rem-Cru's raw material, titanium sponge, still costs the same, $5 a pound, this makes the third price reduction Rem-Cru has effected. Previous prices have been on an item basis; that is, a certain price for a particular gage in a standard size sheet. The new price system, which has been under study for the last few months, is based on production costs and involves realistic base prices and extras for size, condition, finish, quantity. The new system and the price reductions are effective at once.

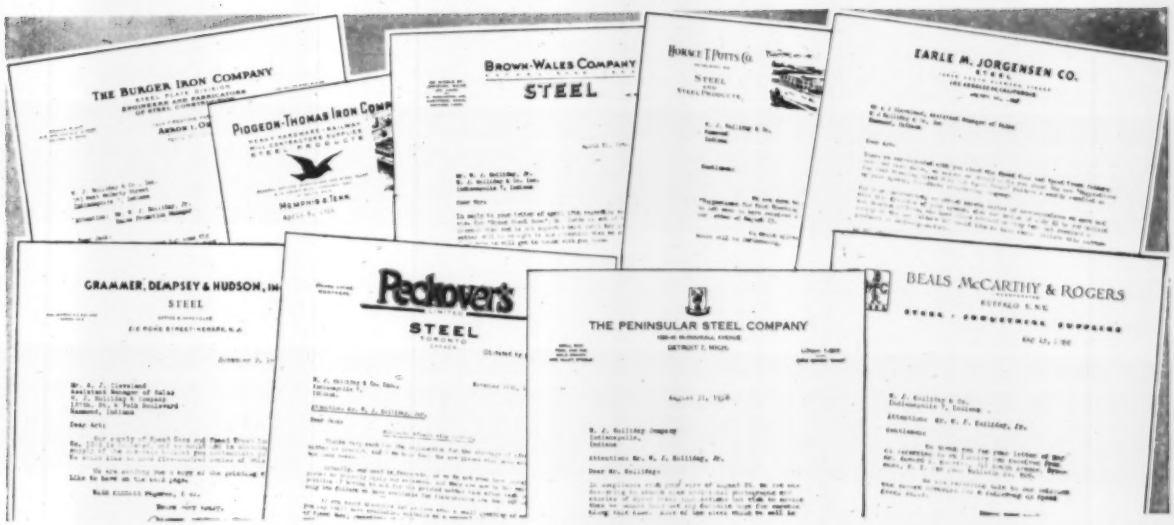
Price reductions depend upon grade, product, size and quantity and vary up to 14 per cent.

The following is the new published price list, in part, covering the products of Rem-Cru Titanium Inc.:

Titanium billet, base price, $9 per lb, f.o.b. mill, for rounds, rectangles and round-cornered squares in RC-55, RC-70 and RC-130-B grades, annealed and cleaned. Size extras in dollars per lb: Over 4 in. to 6 in., inclusive, 0.75; over 6 in. to 8 in., inclusive, 0.50; over 8 in. to 10 in., inclusive, base price; over 10 in., 1.50.

Titanium bar, base price $9 per lb, f.o.b. mill, for rounds, flats and squares in RC-55, RC-70 and RC-130-B grades, mill lengths 6 ft to 12 ft long, annealed and cleaned. Size extras in dollars per lb: Over 2 in. to 4 in., inclusive, 1; over 1 in. to 2 in., 1.50; over ¾ in. to 1 in. inclusive, 2; over ½ in. to ¾ in., inclusive, 2.50; over ¼ in to ½ in, inclusive 3.

Billet and bar extras, in dollars per lb, centerless grinding: Over ¼ in. to ½ in., inclusive, 2.75; over ½ in. to 1 in., inclusive, 2.50; over 1 in. to 2 in., inclusive, 2.25; over 2 in. to 4 in., inclusive, 2; rough turning, 2 in. to 12 in., 1.50. Extras for cutting multiple lengths: Size 6 in. to 10 in., inclusive, in that size, ¼ to 2 in., inclusive, extra is 0.25; over 2 in. to 12



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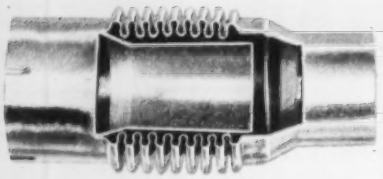

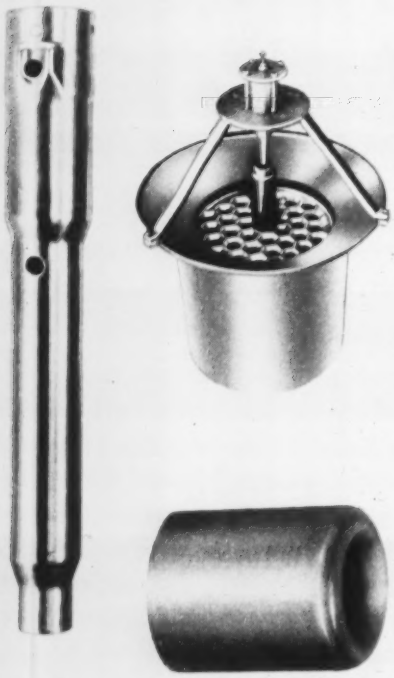

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in., inclusive, 0.50; in size from 10 in. to 18 in., inclusive, ¼ in. to 1 in., inclusive, 0.25; over 1 in. to 12 in., inclusive, 0.50; size from 18 in. to 36 in., inclusive, in that size, size ¼ in. to 1 in., inclusive, 0.25; over 1 in. to 12 in., inclusive, 0.75; in size 36 in. to 60 in., inclusive, size ¼ in. to 1 in., inclusive, 0.50; over 1 in. to 12 in., inclusive, 0.75; in size 60 in. to 96 in., inclusive, size ¼ in. to 12 in., inclusive, 1; extra for cutting exact lengths, add $0.50 to extra for cutting multiple lengths.

For mill base prices and extras on sheet and plate products refer to Feb. 15 issue of STEEL, page 186.

Plates . . .

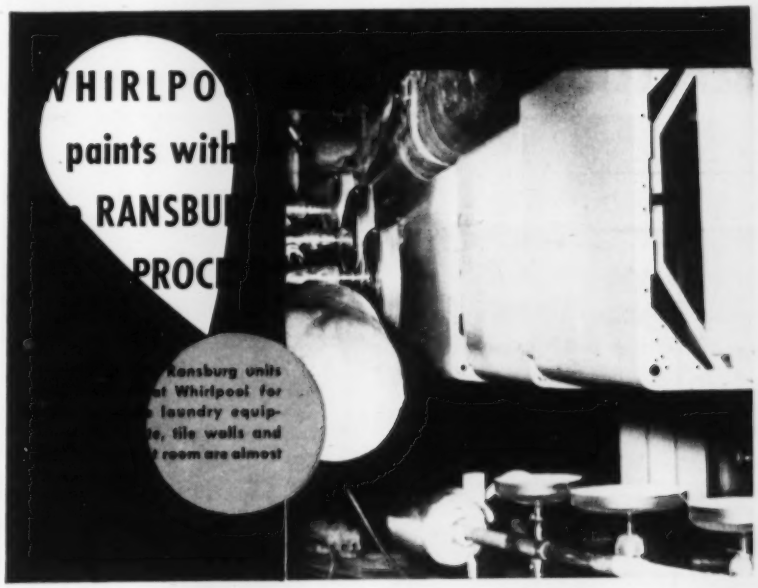
Plate Prices, Page 144

New York—Recent reduction of $3 a ton in the mill plate price at Conshohocken, Pa., has established that point as the governing base on shipments here. The freight rate on 40,000-lb lots (plates don't take the 80,000-lb rate) is 0.368-cent per lb before tax. With the new base at Conshohocken now 4.10c, the delivered price is 4.468c.

Until recently Claymont, Del., was the governing base, by a fraction of a cent over Sparrows Point, the mill price at Claymont having been 4.20c, against 4.10c now, and the freight rate 0.3795c, accounting for the former delivered price of 4.5795c. The current delivered price from Claymont is 4.4795c, and from Coatesville, Pa., where the mill price was dropped $2 a ton to 4.10c, the delivered price is 4.491c, the rate before tax being 0.391c. The delivered price from Sparrows Point, Md., where 4.10c, mill, has long been in effect, is 4.583c, the rate being 0.483c.

Plate demand locally appears to be a shade better. At least some producers are confident their March output will be better even on a daily basis. When the extra number of working days in March are considered, plate production for the month as a whole should be very definitely better, as compared with February.

Boston—Carbon plate premium prices, having completed the circle, have disappeared; 4.10c mill is now general with producers supplying this area. With first quarter bookings drawing to a close, backlogs with mills vary. In no case are they large, but some mills are booked into April except for extreme narrow widths, while others are knocking doors for March. Carbon plates up to 48-in. can be bought for three-four weeks delivery. Heavier stock for weldments also can be delivered within that period; shops are main-



● When Whirlpool Corporation switched from hand spray to the Ransburg No. 2 Process, paint mileage jumped approximately from 8 washer cabinets to TWENTY-TWO cabinets per gallon of paint. Whirlpool, too, was the first to employ the Ransburg "grouping" conveyor, especially suitable for use on washer or refrigerator lines.

Along with this spectacular paint saving, Whirlpool reports a more uniform, higher quality finish on their home laundry products. The number of repaint jobs was cut from 40% to less than 10%, and less than 1% of these are due to defective paint application.

Other economies are being achieved. The former 60-ft. water-washed, down-draft, hand spray booth was taken out, cutting maintenance, make-up air, and heat loss substantially. Since there is no overspray paint to be exhausted with the No. 2 Process, ventilation is needed only for solvent vapor, and make-up air was reduced accordingly.

Appreciating the many advantages achieved on this cabinet line, Whirlpool put three more No. 2 Process Units to work, one on their dryer line . . . one on a miscellaneous parts line . . . and one on their wringer washer line in the Clyde, Ohio, plant.

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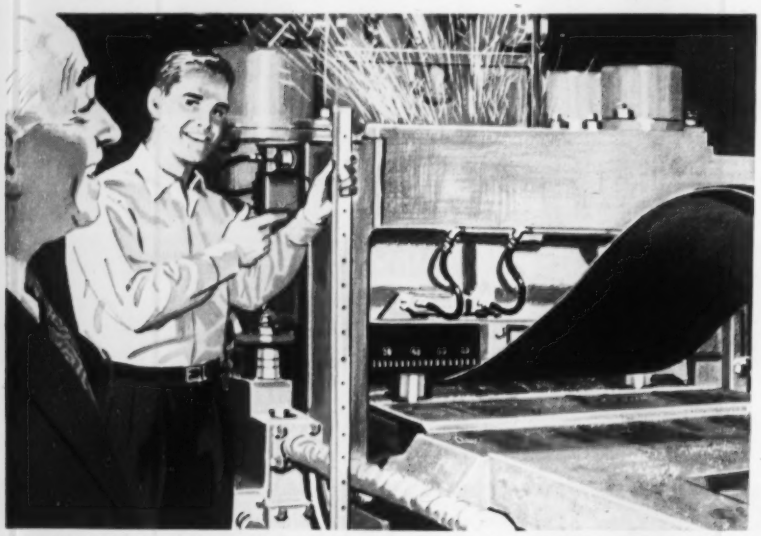
If maintenance is your problem BERYLLIUM COPPER MAY SOLVE IT

THE PROBLEM. Massive flash welders like this are the key to mile-a-minute production of steel strip. They join wide coils together so that they may be continuously fed into the pickling operation. Welders used to be equipped with solid dies made of various electrode materials, but the results were far from satisfactory. The dies picked up flash, and required frequent dressing. They wore rapidly or even fractured under the heavy pounding. Result: heavy maintenance costs, excessive downtime, lowered production.



THE SOLUTION. Many mills, seeking a way to minimize such interruptions and their bad effect on over-all operations, have now redesigned their flash welder dies. The solid die has been replaced by an assembly which uses a fitted insert or electrode made of tough wrought Berylco beryllium copper. The Berylco inserts are capable of taking heavy punishment and do not fracture. They wear better. Flash adherence is reduced, and thus dressings are less frequent. Maintenance costs are down, production is up, and with it all welds are smoother and sounder. Only Berylco, with its combination of electrical conductivity and ruggedness, could have made such results possible.

THIS IS A TYPICAL ILLUSTRATION of Berylco's ability to cut maintenance costs to the bone. The same success might be cited in such products as business machines and home appliances, where beryllium copper parts, large and small, assure continuous customer satisfaction and eliminate expensive service calls. Plan now to build service-free performance into your product with Berylco. For sample material or engineering help, write THE BERYLLIUM CORPORATION, Dept. 4B, Reading 19, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper

taining liquid inventory on this delivery basis and some are carrying in stock 50 per cent less steel than they did one year ago.

Philadelphia—Recent reductions to a 4.10c, base, have placed the Philadelphia delivered prices of the Claymont, Del., and Conshohocken, Pa., producers on a parity, both having the same freight rate of 0.1035-cent, before tax, on 40,000-lb carlots. Their delivered prices of 4.2035c, Philadelphia, are now the lowest here. Previously, with Claymont quoting 4.20c and Conshohocken 4.25c, the former was the governing base. What action, if any, other producers selling here will take toward equalization remains to be seen. Among the latter, the Coatesville, Pa., producer has a delivered Philadelphia price of 4.2725c, and the Sparrows Point producer, 4.4335c. Both of these latter mills also have a 4.10c base.

Pittsburgh—Heavy plate demand helps to keep Pittsburgh among the leading steelmaking areas in percentage of production capacity in operation. Reasons for strong plate sales include heavy requirements of plate for transmission pipe in pipelines and barge-building activity.

Seattle—Plate fabricators anticipate a busy period for the greater part of the year as governmental Alaskan projects, also at Arco, Idaho, and Hanford, Wash., in addition to expansion by private industry, give promise of continued activity in this line.

Tubular Goods . . .

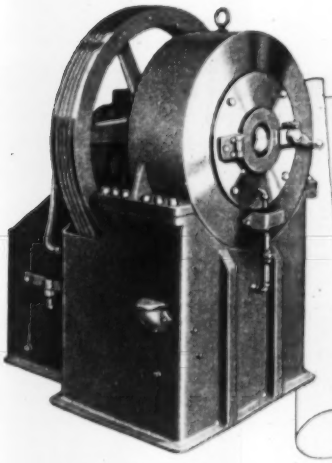
Tubular Goods Prices, Page 147

Pittsburgh—March sales will be little better than February totals, producers say. Buttweld pipe demand shows indications of improvement, but sales of electric weld tubing are slow.

March orders of mechanical tubing may show a decrease from February. Incoming orders are smaller volumewise than last month. In pressure tubing, producers say railroads and boilermakers, two principal consumers, are holding onto inventories.

Babcock & Wilcox Co. lowered prices of its seamless boiler tubes. Reductions in hot-rolled seamless ranged from $2.44 to $3.98 per 100 ft, and reductions in cold-drawn seamless ranged from $2.29 to $4.81 per 100 ft. Competitive market conditions were given as the cause for the price cuts. For the new prices, see page 147 of this issue.

Los Angeles—Demand for casing



Swaging Success Stories

Mandrel Swaging...for time and cost savings

Look at the savings!

1. Saving in time—swaging is fast, increases output.

2. Saving in labor—swaging can be done by unskilled labor.

3. Saving on machining—swaging reduces metal, does not cut it away wastefully.

4. Saving on rejects—the one piece tube is a generally better product than the assembly—has a better finish, better resiliency.

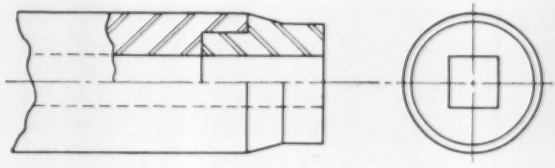
An informative booklet on swaging containing complete descriptions of Torrington Rotary Swagers is yours for the asking. Send for it today; it may save you money tomorrow.

See Torrington Swaging Machines in action.

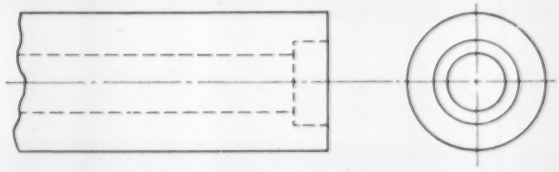
VISIT BOOTH 964

at the ASTE Industrial Exposition, Philadelphia, April 26-30.

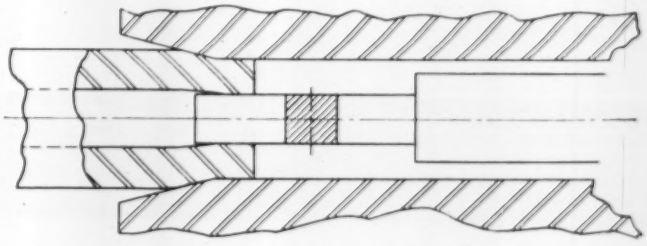
THE TORRINGTON COMPANY
Swager Department
150 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings



This connector tube has a 3/8″ bore, and one end is fitted with a turned nose piece which has a 5/16″ square broached hole to receive a square driving rod. The cost of the tube was greatly influenced by the cost of making and assembling the nose piece.



Torrington swaging experts were able to eliminate the assembly and turning of the nose piece by simply redesigning the blank tube.



Result—one swaging operation over a square mandrel, and the piece was finished except for squaring up the end.

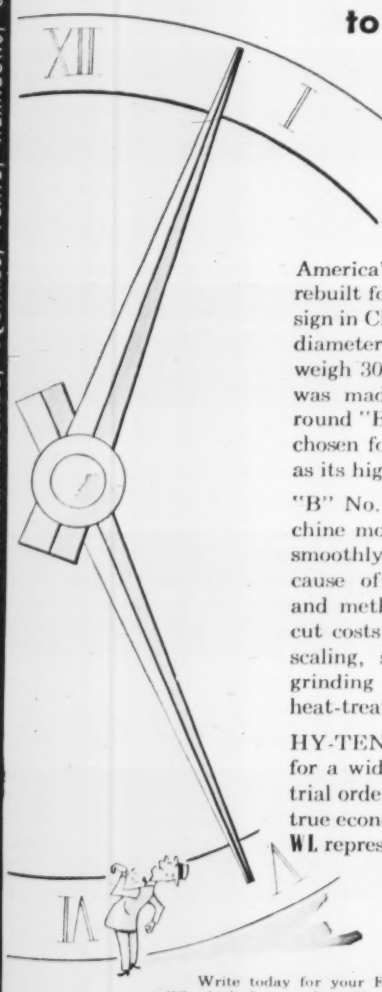
TORRINGTON ROTARY SWAGING MACHINES

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS

it's the right time

to Investigate the Qualities of HY-TEN ALLOY STEEL



America's largest clock was recently rebuilt for a spectacular illuminated sign in Chicago. It measures 50 ft. in diameter — hands and movement weigh 3000 lbs. The new driveshaft was made from 6 ft. of 3½-inch round "B" No. 3X heat-treated bar, chosen for its machinability as well as its high physical properties.

"B" No. 3X heat-treated bars machine more readily and finish more smoothly than standard alloys because of their particular analysis and method of manufacture. They cut costs by eliminating distortion, scaling, straightening — and often grinding — as well as the cost of heat-treating finished parts.

HY-TEN "B" No. 3X bars are used for a wide range of applications. A trial order will convince you of their true economy. Just call your nearest WL representative.

Write today for your FREE COPIES of Wheelock, Lovejoy Data Sheets, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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and small diameter pipe is currently easing, but will be sustained this year by oil drilling activity which is estimated only 4 per cent under the 1953 rate.

Seattle—Seasonal activity in the cast iron pipe market is developing rapidly as municipalities plan to cover requirements. Eugene, Oreg., is in the market for 400 tons, 16 to 4 in., bids Feb. 23.

Price List Covers Large Pipe

Pittsburgh — United States Steel Corp.'s National Tube Division and Consolidated Western Steel Division published prices, f.o.b. mill, for large diameter electric welded pipe in sizes from 24 in. to 36 in. The new prices approximate those in effect on current contracts and apply to all outstanding quotations and new orders to be booked. The electric weld pipe mills at Los Angeles, San Francisco and Orange, Calif., and McKeesport, Pa., were installed during recent years to meet the demand from the oil and gas industry for large diameter line pipe.

Weirton Boosts Coke Capacity

Weirton Steel Co., Weirton, W. Va. has made the initial charging and pushing of its new No. 8 coke battery, reports Thomas E. Millsop, president. Weirton is a division of National Steel Corp., Pittsburgh.

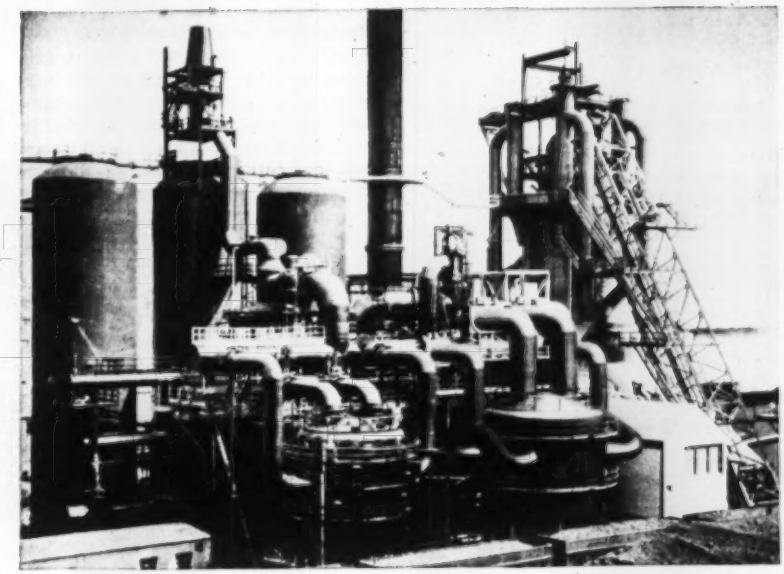
The new coke battery, constructed by Koppers Co. Inc., Pittsburgh, consists of 41 underjet Koppers-Becker type ovens which are 13 ft high, 40 ft 6 in. in length and 17 in. average width. The ovens have a 3-in. taper from the pusher side to the opposite side where coke is discharged.

Ovens in the new battery are designed to hold a 17-ton coal charge, this figure being based upon 50 lb per cu ft of coal. The battery will daily consume 1000 tons of coal and produce 700 tons of furnace coke. The ovens are pushed on a fixed schedule of every 17 hours.

Coke battery No. 1, which consists of 37 ovens and began operating on July 4, 1923, will be dismantled, while batteries Nos. 2 and 3 were torn down some years ago. The remaining batteries Nos. 4, 5, 6 and 7 (No. 7 stands where 2 and 3 formerly stood) plus the new No. 8 battery, will give Weirton Steel Co. a total of 253 ovens capable of producing 4500 tons of furnace coke per day. No. 4 battery consists of 45 ovens, Nos. 5 and 6 have 53 ovens each, and No. 7 consists of 61 ovens.

The No. 8 battery, which required about a year to complete, was con-

(Advertisement)



How Cottrell Precipitators Clean Gas in the Steel Industry

Iron Ore Sintering Plants

The first commercial Cottrell installation for cleaning gases coming from the iron ore sintering machines was placed in operation in 1952 with collection efficiencies exceeding 95%. In this installation the gases leaving the windboxes of the sintering machine pass to a flue, then to a mechanical collector, to the induced draft fans, to the precipitator, and then to stack. The gases enter the precipitator at temperatures of about 250 to 300F, with water vapor content of about 8%. The dust collected is dry and quite fine. The precipitators used on this application are of the horizontal steel plate type.

Iron Blast Furnaces

The cleaning plant in most iron blast furnace installations consists of the preliminary stage (dry dust catchers), the primary stage (water scrubbers) and the secondary stage (water-flushed Cottrell Precipitators). Dust and fume content of the gas is reduced to the range of 0.1 to 0.3 grains per cubic foot of gas corrected to standard conditions before it reaches the Electrical Precipitator. The function of the precipitator is to further clean this gas to a final dust content ranging in most cases from 0.005 to 0.01 grains per cubic foot, depending on how the gas is to be used.

Open Hearths

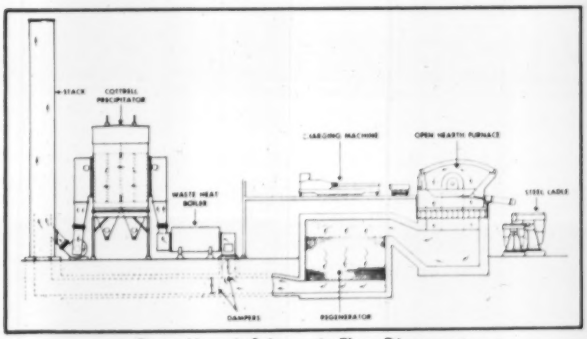
This problem involves the cleaning of combustion gases coming from furnaces, usually oil-fired, and carrying in suspension a heterogeneous mixture of very fine metallic oxides.

After extensive research and pilot plant studies, Research Corporation completed the first commercial precipitator installation for cleaning open hearth gases in 1951. Test results at rating indicated efficiencies of over 95% were obtained. Most of the time there was no visible discharge.

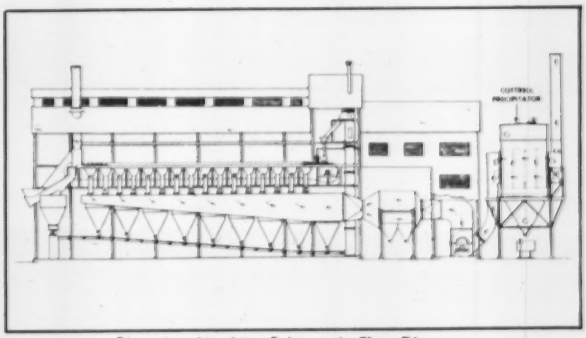
Other Steel Applications

In addition to the above, Research Corporation Cottrell installations are being used for detarring by-product coke oven gas, cleaning oven fuel gas and producer gas, and cleaning ferromanganese blast furnace gas.

Detailed information on all these applications is available through your nearest Research Corporation office.



Open Hearth Schematic Flow Diagram



Sintering Machine Schematic Flow Diagram

RESEARCH CORPORATION

405 Lexington Avenue, New York 17, N. Y. • *Bound Brook, N. J.*

Grant Building, Pittsburgh 19, Pa. • *122 South Michigan Avenue, Chicago 3, Ill.*

RC145

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	22.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite min. 60%, WO_3	23.80
Domestic scheelite, mine	63.00

Manganese Ore

Mn. 48% nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05-$1.07.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mb content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.80
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-47
Birmingham area	$45.00†

† With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky.; net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches — Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5¼	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

structed at the end of No. 6 battery. These two, along with battery No. 5, make a total of 147 ovens in line.

As coke is produced at the coke plant, it goes to the screening station and is sorted according to size. It is then transported by a conveyor belt system from there—a distance of about 475 ft—to the highline at the blast furnace, and is there distributed into coke cars to feed the furnaces.

Structural Shapes . . .

Structural Shape Prices, Page 144

Boston—Structural tonnage, first quarter, will be heavier than for the corresponding period in 1953. This is one steel product moving contrary to the current trends. Bridges account for this for most part, but building work inquiry also holds up fairly well, bolstered by military and public work.

New York—While not supported much by new orders, there is a better undertone to the structural market. Inquiry has improved slightly, although involving few sizable jobs.

Philadelphia—Trading in finished steel is mixed, with the over-all picture perhaps a mite improved. Producers are still looking to March for something more definite in the way of a trend. Some are confident that seasonal influences will result in at least a modest improvement.

Twelve thousand tons for a section of the Philadelphia-Gloucester, N. J., bridge for the Delaware River Port Authority are reported placed with Bethlehem Steel Co., low bidder.

Seattle — Competition continues keener for structural business in a pronounced buyers' market. While larger projects are lacking at the moment, fabricators report a considerable tonnage in small lots for schools, industrial plants and highway work. Backlogs are melting, but the outlook is good.

Big Bridge Contracts Let

New York — State of Michigan Mackinac Bridge Authority, Lansing, Mich., received a check for $99.8 million realized from the sale of bonds for a 5-mile bridge across the Straits of Mackinac. The bridge, ranking with the world's largest in weight and length, is expected to be completed Nov. 1, 1957.

A $44.5 million contract with U. S. Steel Corp.'s American Bridge Division has been placed for erection of the superstructure; a $26 million contract to Merritt-Chapman & Scott Corp., New York, for the substruc-

ture (see Structurals Placed, p. 172).

The bridge will be about 4 miles long, and, with immediate approaches, 5 miles. Actual work on the superstructure at the site will begin next year; work on the substructure, at once.

Two cables, each 24.25 in. in diameter, will carry the four-lane structure. Each cable will be composed of 37 strands of 348 wire, 0.196 in. in diameter. All wire will be galvanized and the total number used will be 12,876 wire per cable.

Steel towers will be of the conventional flexible type with fixed bases.

Tool Steel . . .

Tool Steel Prices, Page 148

Pittsburgh—Latrobe Steel Co., Latrobe, Pa., has just announced the free-machining properties of its Olympic FM air-hardening high production die steel have been extended to its entire line of high carbon-high chromium die steels which now can be obtained as free-machining steels.

Pig Iron . . .

Pig Iron Prices, Page 148

Chicago—A spotty condition prevails in pig iron demand. Output of farm implement castings is rising moderately and building and construction products are holding steady. Most other lines, including machine tools, are off. Operations of ferrous foundries range variously from three days to six days and this is reflected in iron orders and shipments.

Boston—Most foundry iron consumers are keeping inventories down. Gray iron and malleable shops, with few exceptions, lack backlogs and, some, operating four days a week, are not melting at capacity on this schedule.

New York—Pig iron buying is sluggish, with little change noted in the trend. Most sellers are counting on a slightly better month in March, but say there is little to indicate much improvement yet.

Buffalo—Automotive demand continues as the principal support for merchant pig iron, but about 80 to 85 per cent of current reduced output is going into ingot production channels.

Philadelphia—Pig iron sellers anticipate only small improvement in the immediate future. Most consumers have reduced stocks substantially, but with casting business still dragging, except for the pressure pipe producers, and with plenty of iron available for prompt shipments, they

(*Please Turn to Page* 167)

Ready-Power offers 4 important advantages

OVER ALL OTHER GAS-ELECTRIC DRIVES

1—ONLY READY-POWER CAN BE QUICKLY CHANGED. A spare can be installed in 5 minutes!

2—ONLY READY-POWER CAN BE SHIFTED FROM ONE TRUCK TO ANOTHER, permitting standardization of power.

3—ONLY WITH READY-POWER CAN YOUR TRUCKS BE KEPT WORKING with a quick change of power units.

4—ONLY READY-POWER OPERATES AT THE LOW ENGINE SPEED that results in long life and low maintenance.

Remember . . . your truck is no better than its power. It PAYS to convert present electric trucks to Ready-Power . . . and it PAYS to specify Ready-Power when buying new trucks.

CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-86%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon: No. 2: (Cr, 36-39%, Si 26-29%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max): $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 56c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.6c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more, $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max.) Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max; ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-075%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

new application . . .

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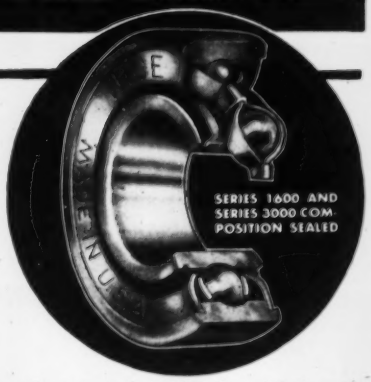

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Pig Iron . . .

(*Concluded From Page* 163)

are buying only as new order requirements arise and are not worrying about building up inventories.

Pittsburgh—Some steel foundries have worked through inventories, causing slight improvement in pig iron shipments. Most foundry operations remain slow.

Seattle—Foundry operators report business is rather slack, about normal for this time of year. Prospects for the near future are good, although increased competition has to be met. The material situation is satisfactory.

Cast iron scrap is in ample supply, No. 1 cupola being quoted at $35-$37; electric furnace, $35; stove plate, $29, delivered.

Plants in this area generally are using foreign pig iron, mostly from South Africa. Imported iron averages $10 per ton less than domestic.

Rails, Cars . . .

Track Material Prices, Page 147

New York—Freight car orders in January involved 2953 units, according to a joint statement by American Railway Car Institute and Association of American Railways. Order backlogs as of Feb. 1 amounted to 27,959, against 29,950, Jan. 1.

Deliveries of domestic freight cars last month totaled 4944, against 4456 in December and 7981 in January, 1953.

Iron Ore . . .

Iron Ore Prices, Page 162

Cleveland—Prices of iron ore for 1954, as far as Cleveland-Cliffs Iron Co. is concerned, are the same as those which became effective July 1, 1953 (see page 162). The firm has sold substantial tonnages for delivery in the 1954 shipping season to several large steel companies at these levels, says John S. Wilbur, vice president-sales.

Washington—Iron ore production in the U. S. declined in November, reports the Bureau of Mines. Both output and shipments, 6,392,403 tons and 6,997,834 tons, respectively, were 48 per cent below the figures for October. Compared with November, 1952, production and shipments were 32 and 39 per cent less, respectively, and were the lowest for any November since 1949.

Consumers' stocks of ore and sinter totaled 56,279,913 gross tons on Nov. 30, of which 46,810,264 tons or 83 per cent were held in Illinois, In-

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diana, New York, Ohio and Pennsylvania. These totals were 7 per cent and 8 per cent, respectively, higher than at the end of November, 1952. Mine stocks were 4,800,065 tons, 11 per cent below October and 6 per cent below November, 1952.

Ore imports in November amounted to 964,945 tons, a decrease of 11 per cent below October and 4 per cent lower than in November, 1952.

ICC Rules on Iron Ore Rates

Washington—Interstate Commerce Commission gave Philadelphia rail freight equality with Baltimore on imported iron ore shipped from the two ports to midwestern steel mills. Under the ICC decision, Pennsylvania Railroad will be able to charge $2.71 per ton for ore hauled from Philadelphia to the Youngstown area. This is the same rate the Baltimore & Ohio and Western Maryland railroads have been charging since 1950 for Baltimore-to-Youngstown trips.

The decision represents a major victory for Philadelphia and a lesser triumph for Baltimore in a rate war over a commodity steadily increasing in importance. From 1936 to 1941, ICC pointed out, about 2.5 million tons of iron ore were imported annually. In 1952, however, the nation's steel industry imported about 9,750,000 tons of iron ore, of which almost three-quarters came in at Baltimore.

Scrap . . .

Scrap Prices, Page 170

Philadelphia—Continued dullness is resulting in a further decline in steel scrap. Small lots of No. 1 heavy melting steel and No. 2 heavy melting steel have been sold at $25 and $22, delivered consumer plants, respectively, a drop of $1 a ton. A small sale of No. 2 bundles has been done at $20, also a drop of $1. No. 1 bundles are off $2 a ton to $24, delivered and No. 1 busheling has been reduced nominally to $25. A nominal reduction also places electric furnace bundles at $27.

Weakness is reflected in machine shop turnings and mixed borings and turnings, which now are being quoted nominally at $12-$13, and $14-$15 delivered, respectively. Short shovel turnings have dropped to $18-$19 and low phos structurals and plate to $30-$31. Heavy turnings have declined to $22-$23 and couplers, springs and wheels to $30. Rail crops, 2 ft and under, have eased slightly to $40.

Cast iron grades are moving in sufficient volume to maintain prices at unchanged levels.

New York—With domestic trading in steel scrap at a virtual standstill, sellers are endeavoring to stimulate foreign business. A ship is being loaded here with 9000 tons for Japan and one dealer in Jamaica, L. I., is advertising in the local newspapers for bids Mar. 10, on an f.o.b. vessel basis, on 10,000 tons per month for export—50 per cent No. 1 heavy melting and No. 1 bundles and 50 per cent No. 2 heavy melting and No. 2 bundles.

Scrap sellers don't think for a minute that a stepping up in foreign trading is going to offset in important degree existing dullness in domestic business, but believe it would at least help.

Brokers have reduced their nominal buying prices on machine shop turnings to $6-$7, mixed borings and short turnings to $9-$10 and short shovel turnings to $8-$9.

Some trading in cast iron grades continues at unchanged prices.

Cleveland—The market on steelmaking grades of scrap is off an-

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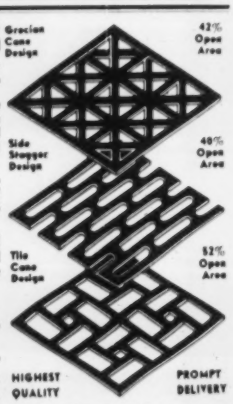

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other $1 to $2 per ton, though in the absence of sales prices are purely nominal, representing what brokers and dealers think material would move at if the mills were to seek representative tonnage. In part, current price views are based on a reported sale of 10,000 tons of electric furnace material to a Valley consumer at $26, delivered. Some dealers, however, dispute the claim this sale was quality electric furnace material and decline to accept it as a guide in setting the market for No. 1 heavy melting. In view of the continued lack of dealer scrap buying by the mills and mounting stocks, market observers are anticipating a further drop in prices.

Boston—Steel scrap buying is stagnant at current low prices. Consumer inventories are ample with melt varying well below capacity from week to week. Yard operations and buying reflect lack of activity and most have substantial supplies of prepared material bought at prices higher than current shipping point quotations. Yard operators are taking in less tonnage, paying around $8 for light steel and $13 for No. 1 busheling. Light industrial scrap, borings and turnings, are down to the lowest price in years.

Buffalo—Complete absence of buying of any consequence leaves the scrap market on the weak side with prices nominally unchanged. Sentiment among dealers is depressed.

Pittsburgh—Prices continued to drop early last week. No. 1 heavy melting was quoted at $28-$29. Other blast furnace grades fell, but cast iron scrap remained fairly level. No major sales have been reported.

Washington—First appointments of chairmen and vice chairmen of the standing committees of the Institute of Scrap Iron & Steel for 1954 were announced last week by David C. Holub, president of the organization as follows:

Baler's committee—Maurice A. Schlafer, Schlafer Iron & Metal Co., Detroit, chairman; Harry Goldberg, Goldberg Iron & Steel Co., Columbus, O., vice chairman. Finance committee—S. Allen Nathanson, M. Cohen & Son Co., Cleveland, chairman; Irvin M. Bettman, the David J. Joseph Co., Cincinnati, vice chairman. Councillor to the Chamber of Commerce of the United States, Arant H. Sherman, Alter Co., Davenport, Iowa.

Cincinnati—The scrap market continues quiet. All mill orders for February have been covered. Purchases which have been made were for limited tonnages.

Chicago—Weak demand for steelmaking scrap has produced a few

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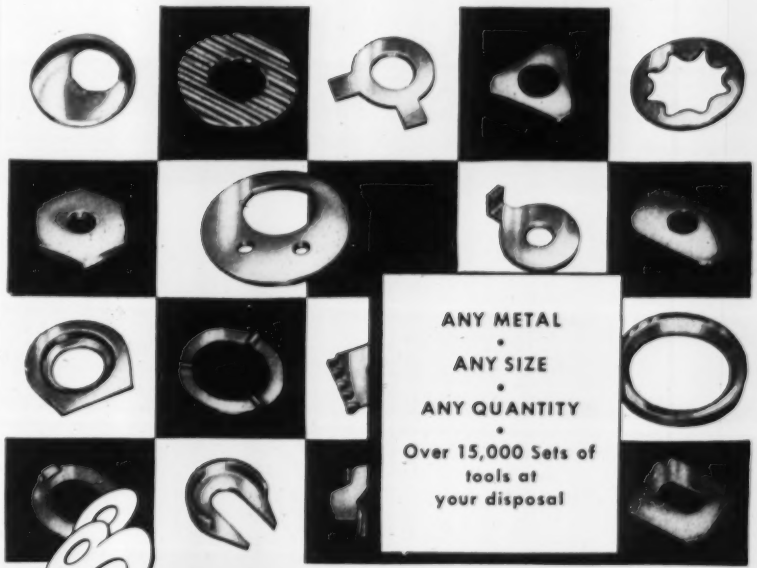

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 18	$26.83
Feb. 11	27.50
Jan. Avg.	29.05
Feb. 1953	43.00
Feb. 1949	38.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*28.00-29.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*13.00-14.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals	*31.00-32.00*
Heavy turnings	28.00-29.00
Punchings & plate scrap	*29.00-30.00*
Electric furnace bundles	*30.00-31.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	34.00-35.00
Heavy breakable cast	*30.00-31.00*
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	*29.50-30.50*
Rails, 2-ft. and under	*44.00-45.00*
Rails, 18-in. and under	*45.00-46.00*
Rails, random lengths	*37.00-38.00*
Railroad specialties	37.00-38.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*23.00-24.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*18.00-19.00*
No. 1 busheling	*23.00-24.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*14.00-15.00*
Cast iron borings	*14.00-15.00*
Low phos.	*26.00-27.00*
Alloy free, short shovel turnings	17.00-18.00
Electric furnace bundles	*23.00-24.00*

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Charging box cast	*26.00-27.00*
Stove plate	*34.00-35.00*
Heavy breakable cast	*23.00-24.00*
Unstripped motor blocks	*21.00-22.00*
Brake shoes	*30.00-31.00*
Clean auto cast	*40.00-41.00*
No. 1 wheels	*36.00-37.00*
Burnt cast	*27.50-28.50*
Drop broken machinery	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*27.00-28.00*
R.R. malleable	40.00-41.00
Rails, 3-ft. and under	42.00-43.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Cast steel	33.00-34.00
Railroad specialties	33.00-34.00
Uncut tires	35.00-36.00
Angles, splice bars	40.00-41.00
Rails, rerolling	40.00-41.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*25.00-26.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings	*12.00-13.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos.	*26.00-27.00*
Electric furnace bundles	*26.00-27.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*27.00-28.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*25.00*
No. 2 heavy melting	*22.00*
No. 1 bundles	*24.00*
No. 2 bundles	*20.00*
No. 1 busheling	*25.00*
Electric furnace bundles	*27.00*
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*18.00-19.00*
Structurals & plate	*30.00-31.00*
Heavy turnings	*22.00-23.00*
Couplers, springs, wheels	*30.00*
Rail crops, 2 ft & under	*40.00*

Cast Iron Grades

No. 1 cupola	34.00-35.00
Malleable	38.00-39.00
Heavy breakable cast	36.50-37.50
Unstripped motor blocks	28.00
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	18.00*
No. 2 heavy melting	16.00*
No. 1 bundles	18.00*
No. 2 bundles	14.00*
Mach. shop turnings nom	*6.00-7.00**
Mixed borings, short turnings	*9.00-10.00**
Low phos. (structural & plate)	25.00-26.00*
Short shovel turnings	*8.00-9.00**

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	80.00-85.00
430 sheets, clips, solids	50.00
410 sheets, clips, solids	40.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*15.00-15.50*
No. 2 heavy melting	13.00-13.50
No. 1 bundles	*14.50-15.00*
No. 2 bundles	11.00-11.50
Machine shop turnings	*3.00-3.50*
Mixed borings, turnings	6.00-6.50
Short shovel turnings	*7.00-7.50*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	18.00-19.00
No. 1 busheling	23.00-24.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	13.50-14.50
Short shovel turnings	13.50-14.50
Cast iron borings	13.50-14.50
Low phos., 18-in.	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast	32.00
Charging box cast	32.00
Drop broken machinery	42.00

Railroad Scrap

No. 1 R.R., heavy melt	29.00-30.00
Malleable	*33.00-34.00*
Rails, 18-in. and under	43.00-44.00
Rails, random lengths	36.00-37.00

CHICAGO

No. 1 heavy melting	26.00-28.00
No. 2 heavy melting	*20.00-21.00*
No. 1 factory bundles	28.00-29.00
No. 1 dealer bundles	23.00-24.00
No. 2 bundles	*18.00-19.00*
No. 1 busheling	26.00-28.00
Machine shop turnings	9.00-10.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut structurals, 3-ft	29.00-30.00
Punchings & plate scrap	30.00-31.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Stove plate	24.00-25.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	*34.00-35.00*
Drop broken machinery	*33.00-35.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*28.00-29.00*
R.R. malleable	37.00-38.00
Rails, 2-ft. and under	39.00-40.00
Rails, 18-in. and under	40.00-41.00
Angles, splice bars	34.00-36.00
Rails, rerolling	36.00-37.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	42.00
430 turnings	nom. 25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*18.00*
No. 2 heavy melting	*16.50*
No. 1 bundles	*18.00*
No. 2 bundles	*16.50*
No. 1 busheling	*18.00*
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	10.00
Punchings & plate scrap	*20.00*

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	*28.00*

BUFFALO

No. 1 heavy melting	24.50-25.50
No. 2 heavy melting	21.50-22.00
No. 1 bundles	24.50-25.50
No. 2 bundles	19.50-20.00
No. 1 busheling	24.50-25.50
Machine shop turnings	12.00-13.00
Mixed borings, turnings	14.00-14.50
Short shovel turnings	15.00-15.50
Cast iron borings	14.00-14.50
Low phos.	28.50-29.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	27.50-28.50
No. 1 machinery	32.50-33.50

Railroad Scrap

Rails, random lengths	31.50-32.50
Rails, 2-ft and under	36.50-37.50
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Cast iron borings	17.00-18.00
Short shovel turnings	17.00-18.00
Machine shop turnings	19.00
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	31.00-32.00
Plate and structurals	31.00-32.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft. and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*25.00*
No. 2 heavy melting	*24.00*
No. 1 bundles	*25.00*
No. 2 bundles	*21.00*
Machine shop turnings	*7.00*
Short shovel turnings	*9.00*

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	25.00
Heavy breakable cast	25.00
Unstripped motor blocks	25.00
Brake shoes	*30.00*
Clean auto cast	37.00
Stove plate	27.00

Railroad Scrap

No. 1 R.R. heavy melt	*28.00*
Rails 18-in. and under	*38.00*
Rails, random lengths	33.00
Rails, rerolling	36.00
Uncut tires	31.00
Angles, splice bars	33.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	*35.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate (f.o.b. plant)	29.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-38.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$26.00
No. 2 heavy melting	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	15.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	15.00

Cast Iron Grades†

No. 1 machinery cast	42.00

†F.o.b., shipping point.

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more price reductions of about $1 a ton on material of dealer origin, namely No. 2 heavy melting and No. 2 bundles. The latter at $19 a ton is virtually unwanted.

Blast furnace scrap is moving slowly at unchanged prices.

Cast grades are comparatively stable, although trading is limited because of restricted foundry operations.

St. Louis—Steelmaking scrap grades dropped $1 to $2 as brokers marked down prices hoping to stimulate interest. Low mill operating rates continued to hold new orders to a minimum and substantial railroad lists also boosted supply. Country shipments are moving on schedule, but their total tonnage is small. Scrap brokers deem it fortunate for their price structure that this area's third major source of scrap—the auto wreckers—has dwindled in consequence of low prices.

Birmingham—Scrap has few takers in this district. As has been the case for some months, a moderate tonnage of scrap, chiefly melting steel, is moving to markets elsewhere and most of that is described as selective buying. Demand for cast grades is even smaller and prices remain distinctly on the weak side.

Los Angeles—Cast scrap market is weaker. Melters are pouring 40 per cent less metal compared with last year at this time.

San Francisco—Steel mills' consumption of scrap is rising a bit, but with comfortable inventories they are not ordering much outside tonnage. As a result, the scrap market continues in the doldrums.

Seattle—While the larger buyers are not active in the scrap market, they are in a position to pick choice offers and also to accommodate their regular suppliers. The market has settled at the lower levels established early this month; $25 for No. 1 and $21 for No. 2 heavy melting. Ample supplies are available.

Cast iron is not too plentiful and there is considerable activity in this grade.

Canada . . .

Toronto, Ont.—Steel ingot production in Canada set a new record in 1953, reports H. G. Hilton, president, Steel Co. of Canada, Ltd. At the same time, imports of rolled steel products declined for the second successive year.

For 1953, Canada's output of ingots showed a gain of 12 per cent over the year preceding, totaling 4,010,000 net tons against 3,578,000 in 1952.

Spot buying is replacing long term forward-delivery commitments. As a result, steel mills report unfilled capacity for first quarter but look for fresh buying before end of March.

In the scrap markets, business is at a standstill.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

70,000 tons, superstructure, bridge over Straits of Mackinac, Michigan Mackinac Bridge Authority, to American Bridge Division, United States Steel Corp., Pittsburgh. Contract, including section, involves $44.5 million. Contract for substructure, involving $26 million, has been placed with Merritt-Chapman & Scott Corp., New York.

12,000 tons, floor structure, contract 6, Philadelphia-Gloucester, N. J., Delaware River Port Authority, reported placed with Bethlehem Steel Co., Bethlehem, Pa.; low bidder.

750 tons, state highway bridge, Deerfield river, Buckland-Charlemont, Mass., to Phoenix Bridge Co., Phoenixville, Pa.; Brunali Construction Co., Southington, Conn., general contractor.

750 tons, state highway bridge, superstructure, Deerfield river, Buckland-Shelburne, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; bids direct to state Department of Public Works, Boston, Feb. 9.

430 tons, shop, Philadelphia Electric Co., Philadelphia, through Wark & Co., general contractor, to Robinson Steel Co., that city.

262 tons, state underpass, Morris county, New Jersey, to Harris Structural Steel Co., New York.

185 tons, plant and office, Pepsi Cola Co., Philadelphia, to General Iron Works, Camden, N. J.

170 tons, S. H. Kress & Co. store, Orangeburg, S. C., through Sordoni Construction Co., Wilkes-Barre, Pa., general contractor, to Montague Steel Co.

STRUCTURAL STEEL PENDING

1600 tons, building, Navy Yard, Philadelphia; plans being revised, with a new date to be set for opening of bids.

240 tons, high school, Jonesville, Pa.; George H. Evans, Philadelphia, low on general contract.

142 tons, state bridge, Perry county, Pennsylvania; bids Mar. 19.

110 tons, black structural steel; bids to Seattle, Feb. 18.

102 tons, state bridge, Crawford county, Pennsylvania; bids Mar. 19.

100 tons, two single span WF beam bridges, Bristol-Starksboro, Vt.; bids Mar. 5, Montpelier, Vt.

100 tons plus, trashrack panels, steel mesh and safety beam; bids to Seattle, Feb. 16.

Unstated, also reinforcing, 714-ft Oregon state bridge, Douglas county; bids to Highway Commission, Portland, Feb. 25.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2345 tons, addition, hospital, Waterbury, Mass., to Fox Steel Co., Hartford, Conn.; W. J. Megin Inc., Naugatuck, Conn., general contractor; 50 tons, structural steel, to Topper & Griggs, Hartford.

140 tons, state highway bridge, Mid-Cape highway, Yarmouth-Barnstable, Mass., to Plantations Steel Co., Providence, R. I.; S. & M. Construction Co., Providence, general contractor; 150 tons, structurals, to Tower Iron Works, Providence, R. I.

100 tons plus, Washington state freeway bridge, Vancouver; to Mercer Steel Co., Portland, Oreg., Hawkins & Armstrong, Seattle, steel subcontractors.

REINFORCING BARS PENDING

400 tons, catholic Blanchet high school, Seattle; general contract to Strand & Son, Seattle, $1,440,623.

215 tons, bridge substructure, Deerfield river, Charlemont, Mass.; Brunali Construction Co., Southington, Conn., low, general contract.

117 tons, state bridge, Bradford county, Pennsylvania; bids Mar. 19.

115 tons, four bridges mid-Cape highway, Dennis-Yarmouth, Mass.; also 85 tons, structural steel.

Unstated, 100-bed, $2½-million base hospital, Fairchild Air Field, Washington state; bids to U. S. Engineer, Seattle, Mar. 16.

Unstated, Oregon highway projects, four reinforced steel bridges, Lane county and 60th avenue overcrossing, Portland; bids to Highway Commission, Portland, Feb. 24.

Unstated, Oregon state highway projects, four bridges Curry county and six concrete deck girder structures, Lane county; bids to Portland, Feb. 25.

Unstated, eight 3-story dormitories, Ladd Air Field, Alaska; bids to U. S. Engineer, Seattle, Mar. 24.

PLATES . . .

PLATES PENDING

Unstated, four steel tanks, total capacity 400,000 gal; bids to Atomic Energy Commission, Richland, Wash., Mar. 16.

PIPE . . .

CAST IRON PIPE PLACED

900 tons, four to 20-in. cast iron pipe, Worcester, Mass. to R. D. Wood & Co., Florence, N. J.

200 tons, two local water districts, Portland, Oreg., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

6200 tons, four to 24-in. cast iron pipe, water supply system, airfield base, Portsmouth, N. H.; contractors' letting under two contracts, Feb. 16, and 24.

400 tons, 16 to 4 in. cast iron pipe; bids to Eugene, Oreg., Feb. 23.

300 tons cif cast iron 27,000 ft plus 8, 6 and 4 inch, Class 150, or alternatives; bids to H. F. Pfromm, clerk, Marysville, Wash., Mar. 1.

STEEL PIPE PENDING

Unstated 16,000 ft plus, 8 and 6 in.; steel pipe; bids to Bess Niva, clerk, Goldendale, Wash., Mar. 1.

RAILS, CARS . . .

LOCOMOTIVES PLACED

India, 120 Pacific-type 4-6-2 steam locomotives, to Canadian Locomotive Co., Montreal, Que.

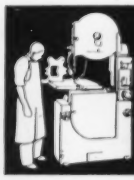
RAILROAD CARS PLACED

American Refrigerator Transit Co., division of Missouri Pacific Railway, 600 refrigerator cars, to Pacific Car & Foundry Co., Seattle.

Fruit Growers' Express Co., 280 refrigerator cars, to Pacific Car & Foundry Co., Seattle.

Great Northern, 22 dome passenger cars, to Budd Co., Philadelphia; order comprises 16 dome coaches and 6 full-length dome sleepers.

Great Northern Railway, 200 all-welded flat cars, to Pacific Car & Foundry Co., Seattle.



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STRUCTURAL SHOP SUPERINTENDENT Age 40. Experience covers all phases of operation of Structural Shop including Engineering and Cost. Reply Box 918, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT OR PRODUCTION MANAGER. Experience covers all phases of plant operation and control, including, costs, methods improvement, incentives and labor relations. M.I.T. graduate. Reply Box 868, STEEL, Penton Bldg., Cleveland 13, Ohio.

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400,000 ft. of tubing in 30 days (3 shift operation).

The objectives are, a continuous flow method for quick delivery, efficient production, and a quality product. Stainless steel is preferred analysis. Process patent under study.

Write Engineer

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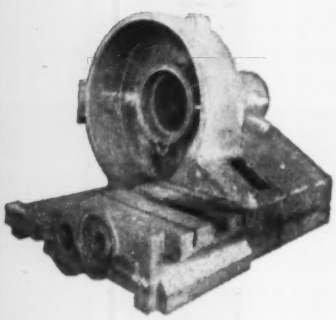
Castings of any size up to 80,000 pounds. Hyde Park facilities are equal to your every requirement



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Advertising Index

Alliance Machine Co., The 122
Allis, Louis, Co., The 117, 118
Aluminum Company of America 29, 30, 31, 32
American Chemical Paint Co. 71, 126
American Nickeloid Co. 20
American Roller Die Corporation 136
American Society of Tool Engineers, The 39
Armco Steel Corporation 46
Avondale Marine Ways, Inc. 9

Baldwin-Lima-Hamilton 14
Beryllium Corporation, The 158
Bethlehem Steel Co. 1
Bigelow-Liptak Corporation 38
Bliss, E. W., Co. 25
Browning, Victor R., & Co., Inc. 168
Bullard Co., The 64

Carpenter Steel Co., The, Alloy Tube Division 156
Cattie, Joseph P., & Brothers, Inc. 166
Charter Wire, Inc. 71
Cincinnati Shaper Co., The 11
Clark Bros. Co. Division of Dresser Operations, Inc. 87
Cleveland Steel Tool Co., The 168
Cleveland Worm & Gear Co., The Inside Back Cover
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 77
Columbia Steel & Shafting Co., Summerill Tubing Division 149
Conco Engineering Works Division of H. D. Conkey & Co. 129
Conkey, H. D., & Co., Conco Engineering Works Division 129
Continental Foundry & Machine Co. 99
Cooper-Bessemer Corporation, The 143
Copperweld Steel Co. 67
Copperweld Steel Co., Ohio Seamless Tube Division 100
Crucible Steel Company of America 89
Cutler-Hammer, Inc. Back Cover

Delta Power Tool Division, Rockwell Manufacturing Co. 33
Dempster Brothers 22
Diamond Manufacturing Co. 168
Dresser Operations, Inc., Clark Bros. Co. Division 87
Dulien Steel Products, Inc. 173

Eastern Machine Screw Corporation, The 168
Ederer Engineering Co. 26
Electric Controller & Mfg. Co., The Inside Front Cover

Falk Corporation, The 13
Fawick Airflex Division, Federal Fawick Corporation 75
Federal Fawick Corporation, Fawick Airflex Division 75

Gas Machinery Co., The 167
Glazer Steel Corporation 172
Goodyear Tire & Rubber Co., Inc., The 4
Gorham Tool Co. 12

Hendrick Manufacturing Co. 169
Holliday, W. J., & Co., Inc. 155
Hyde Park Foundry & Machine Co. 174

Industrial Gear Mfg. Co. 78
Iron & Steel Products, Inc. 173

Jones & Laughlin Steel Corporation 112, 133

Kidde, Walter, & Co., Inc. 10

Lapham Hickey Co. 125
Lee, K. O., Co. 166
Leeds & Northrup Co. 40
Lincoln Electric Co., The 82
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 17
Louden Machinery Co., The 60
Luria Brothers & Co., Inc. 171

McGill Manufacturing Co., Inc. 138
McKay Machine Co., The 59

Macwhyte Co. 3
Magnethermic Corporation 23
Master Products Co., The 169
Metal Blast, Inc. 15

National Steel Corporation 131
Nice Ball Bearing Co. 166
Norton Co. 34

Ohio Locomotive Crane Co., The 166
Ohio Seamless Tube Division of Copperweld Steel Co. 100

Pawtucket Manufacturing Co. 6
Pittsburgh Steel Co., Thomas Strip Division 137

Ransburg Electro-Coating Corporation 157
Ready-Power Co., The 163
Republic Steel Corporation, Bolt & Nut Division 24
Republic Steel Corporation, Union Drawn Steel Division 84, 85
Research Corporation 161
Roebling's, John A., Sons Corporation 41, 111
Ryerson, Joseph T., & Son, Inc. 50

Sandvik Steel, Inc. 153
Sargeant & Wilbur, Inc. 16
Sciaky Bros., Inc. 28
Simonds Abrasive Co. 37
SKF Industries, Inc. 2
Smith, A. O., Corporation, Welding Products Division 109
Standard Oil Co. (Indiana) 21
Standard Pressed Steel Co. 36
Summerill Tubing Division, Columbia Steel & Shafting Co. 149

Tannewitz Works, The 172
Taylor-Winfield Corporation, The 154
Texas Co., The 42
Thomas Strip Division, Pittsburgh Steel Co. 137
Timken Roller Bearing Co., The, Steel & Tube Division 68
Tinnerman Products, Inc. 72
Toledo Stamping & Manufacturing Co. 166
Torrington Co., The, Swager Department 159

Union Carbide & Carbon Corporation, Linde Air Products Co. 17
Union Drawn Steel Division, Republic Steel Corporation 84, 85

Vanadium-Alloys Steel Co. 81
Vanadium Corporation of America 165
Verson Allsteel Press Co. 7

Walsh Refractories Corporation 8
Wean Equipment Corporation 18, 19
Weirton Steel Co. 131
Western Automatic Machine Screw Co. 27
Westinghouse Electric Corporation, Sturtevant Division 45
Wheelock, Lovejoy & Co., Inc. 160
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 77

Yoder Co., The 35
Youngstown Sheet & Tube Co., The 49

Zeh & Hahnemann Co. 168

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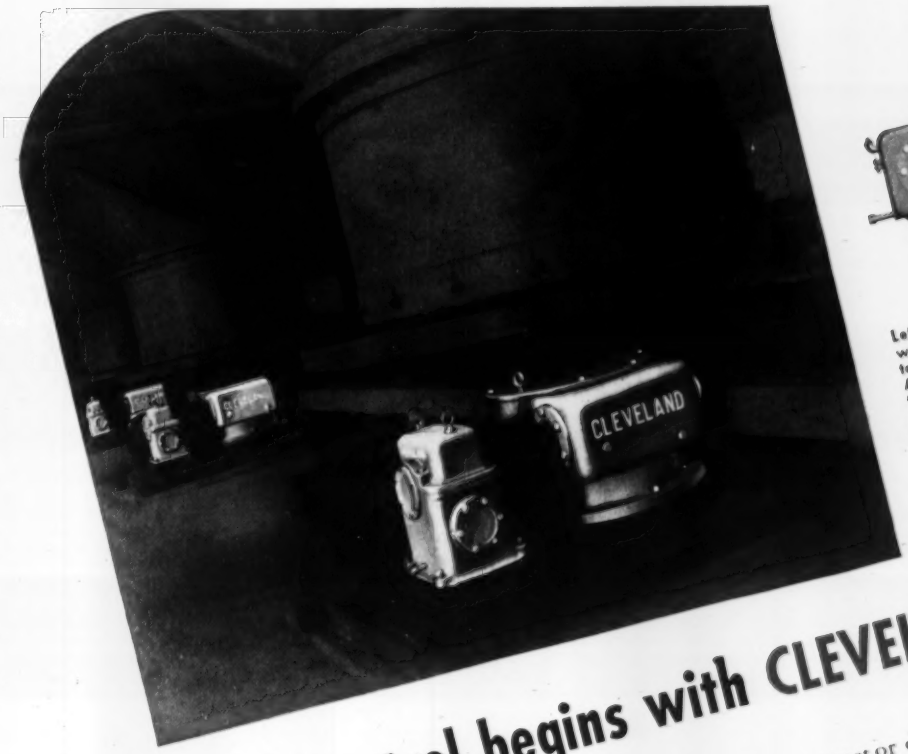
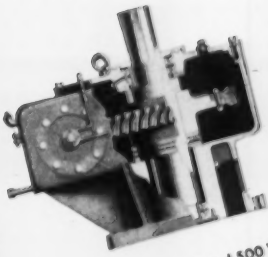
Table of Contents, Page 5

Classified Advertising, Pages 172, 173





Left—Cleveland 100 AT and 500 VT worm gear reducers driving feeder tables in a large mid-western plant. Above—cutaway of an 800 VT feeder table unit shows one-piece gear shaft construction. Since 1912, Cleveland has concentrated its entire engineering and manufacturing effort on worm gearing—your assurance of correct design, precision workmanship and complete dependability.

Perfect feed control begins with CLEVELAND drives

NO MATTER what materials you process, wet or dry, fine or coarse, worm gear feeder table drives maintain steady feed rates at all times.

Cleveland has spent over a quarter century in the continuous development of feeder table drives. A rugged one-piece gear shaft construction carries thrust directly to the base of the unit. This design eliminates distortion and warping of housings under high thrust loads. Thus, wear-resistant case-hardened steel worm and nickel-bronze gear are always in perfect contact to transmit power smoothly and dependably.

You'll find hundreds of Clevelands at work in ore beneficiation and sintering operations, cement, stone-processing and coal preparation plants. Many outlast the machines they drive. *ALL* are run in at the factory before delivery!

Get more feeder table drive information by writing for free Bulletin 140. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

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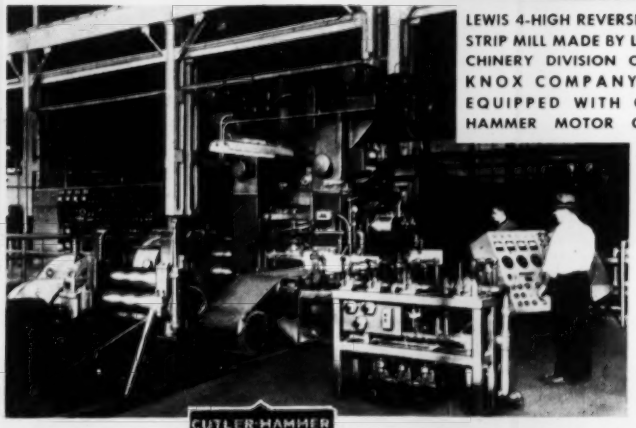
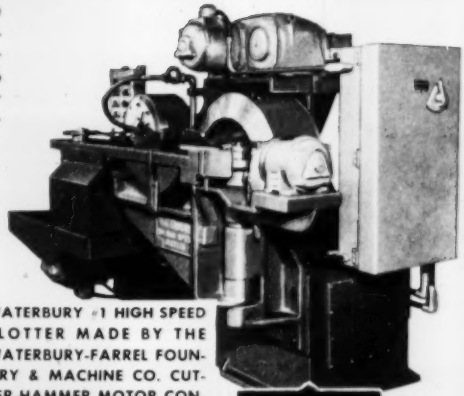
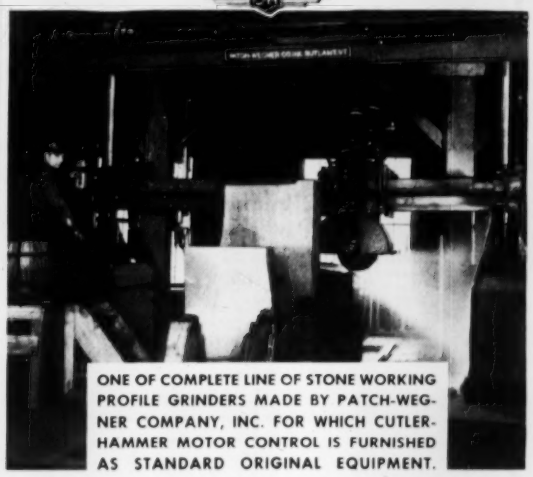


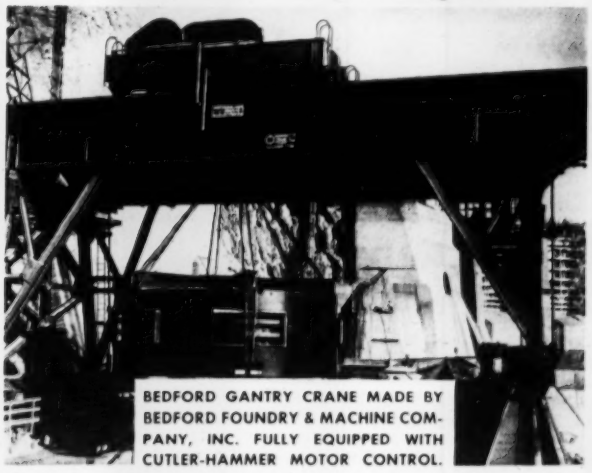
LEWIS 4-HIGH REVERSING COLD STRIP MILL MADE BY LEWIS MACHINERY DIVISION OF BLAW-KNOX COMPANY. 100% EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



WATERBURY #1 HIGH SPEED SLOTTER MADE BY THE WATERBURY-FARREL FOUNDRY & MACHINE CO. CUTLER-HAMMER MOTOR CONTROL FURNISHED AS STANDARD ORIGINAL EQUIPMENT.



ONE OF COMPLETE LINE OF STONE WORKING PROFILE GRINDERS MADE BY PATCH-WEGNER COMPANY, INC. FOR WHICH CUTLER-HAMMER MOTOR CONTROL IS FURNISHED AS STANDARD ORIGINAL EQUIPMENT.



BEDFORD GANTRY CRANE MADE BY BEDFORD FOUNDRY & MACHINE COMPANY, INC. FULLY EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.

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